Commonwealth of Virginia
Operations Model

Commonwealth Interoperability Coordinator's Office
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EXECUTIVE SUMMARY

The Commonwealth of Virginia Operations Model (Ops Model) is a practitioner-driven document intended to guide implementation of the Commonwealth's interoperability strategy by defining a collection of future state capabilities. The future state capabilities described in the Ops Model complement Virginia's interoperability strategy by adding a layer of description to the high level vision, goals, and objectives listed in the *2008 Commonwealth of Virginia Strategic Plan for Statewide Communications Interoperability (Statewide Plan)*. The Ops Model complements the Statewide Plan by defining ideal operational capabilities that the Commonwealth, across all levels of government, can strive to implement. Therefore, to support the achievement of the 2015 Vision, the readers of this document may consider how their projects and efforts align to the list of capabilities when conducting regional and local planning and making procurement decisions.

The Statewide Interoperability Executive Committee (SIEC) suggested the development of this Ops Model to the Commonwealth Interoperability Coordinator's Office (CICO) as means of better defining the direction of the Commonwealth's interoperable communications efforts. Although the Statewide Plan offers a high level vision of the goals, objectives, and strategic initiatives for communications interoperability in the Commonwealth of Virginia, the Ops Model takes this vision one step deeper by considering: *What* will the Commonwealth's emergency responders be able to do by 2015? How well do the current initiatives mentioned in the Statewide Plan advance the Commonwealth towards this 2015 vision?

As its core, the Ops Model contains a list of desired future state capabilities for voice, data, and supporting functions that will support communications during response situations. These future state capabilities, developed by an inclusive Initiative Action Team (Ops Model IAT) of Virginia stakeholders[1], define targeted operational needs and requirements for public safety agencies that will ideally be in place by 2015. The future state capabilities outline goals for functionality available to first responders, but they should not be interpreted, explicitly or implicitly, as mandates imposed on Virginia's regions and localities.[2] These capabilities are solely designed to help descriptively clarify the high-level goals and objectives identified in the Statewide Plan. Furthermore, the CICO will remain flexible to adjusting its target date for completion. Since the future state capabilities require significant planning, coordination, and allocation of resources across all levels of government across the entire Commonwealth, the CICO will evaluate progress and timelines and adjust appropriately closer to the 2015 timeframe.

[1] For a complete list of IAT members and their process in the Ops Model development, see Appendices 5.1 and 5.2.
[2] The Code of Virginia, Title 9.1, chapter 11, consisting of a section numbered 9.1-1200, calls for "*All state agencies and localities shall achieve consistency with and support the goals of the statewide interoperability strategic plan by July 1, 2015, in order to remain eligible to receive state or federal funds for communications programs and systems"*. The Ops Model should not be considered the standard for this mandate, but rather a tool that provides further definition for the goals and objectives identified in the Statewide Plan.

Content Overview

The Ops Model contains the following sections:

Section 1: Introduction – This section describes the purpose, scope, process, and key principles used in the development of the Ops Model.

Section 2: Current State – This section offers a high-level assessment of the current state of interoperable communications within the Commonwealth. This assessment is informed by both the *Virginia Baseline Assessment Report (Baseline)* and the experience and expertise of the IAT stakeholders. This section also contains detailed information on the current Commonwealth of Virginia (CoVA) initiatives.

Section 3: Future State Capabilities – This section lists and describes the future state capabilities for CoVA interoperable communications, as informed by the IAT and SIEC.

Section 4: Analysis – This section takes a look at the future state capabilities and relates them to the CoVA initiatives to identify their relationships and dependencies. Additionally, after analyzing direct and indirect impacts of the CoVA initiatives, the Ops Model IAT identified additional efforts and resources needed to support the future state capabilities.

Section 5: Appendix – This section contains additional information that could serve as helpful resources to the reader.

The Ops Model IAT analyzed existing data (including the Virginia Baseline) to form an understanding of the current state of communications in the Commonwealth (see Section 2). The analysis described challenges around aging equipment and systems, operability, and interoperability, and described current approaches being used to address interoperability. The current state analysis also highlighted mobile data, information systems, and supporting infrastructure issues important to the IAT members. This analysis concluded by describing supporting elements for interoperability including outreach, governance, regional agreements, and spectrum licensing.

After noting current state challenges, the Ops Model IAT developed capabilities for voice, data, and supporting functions using the Definition of Future State Capabilities. A detailed listing and description of these capabilities can be found in Section 3. The future state capabilities covered all levels of government and all scales of incidents according to the scenarios described by the NIMS incident Types 1-5.

To ensure the creation of specific and descriptive statements, the Ops Model IAT developed capabilities using the definition framework depicted in Figure 1. The definition framework offered key criteria to cross-check and verify the content of each capability as it was developed.

Figure 1. Definition of Future State Capability

A functionality available to:

- **First responders or other stakeholders, in**
- **A given incident type (NIMS Type 1-5), for**
- **A specific geographic location or area**
- **Within a given timeframe**
- **Specific to data, the capability should also list out the important data elements/kinds of information of that would be exchanged, such as people, equipment, events, resources, suspect information, etc.**

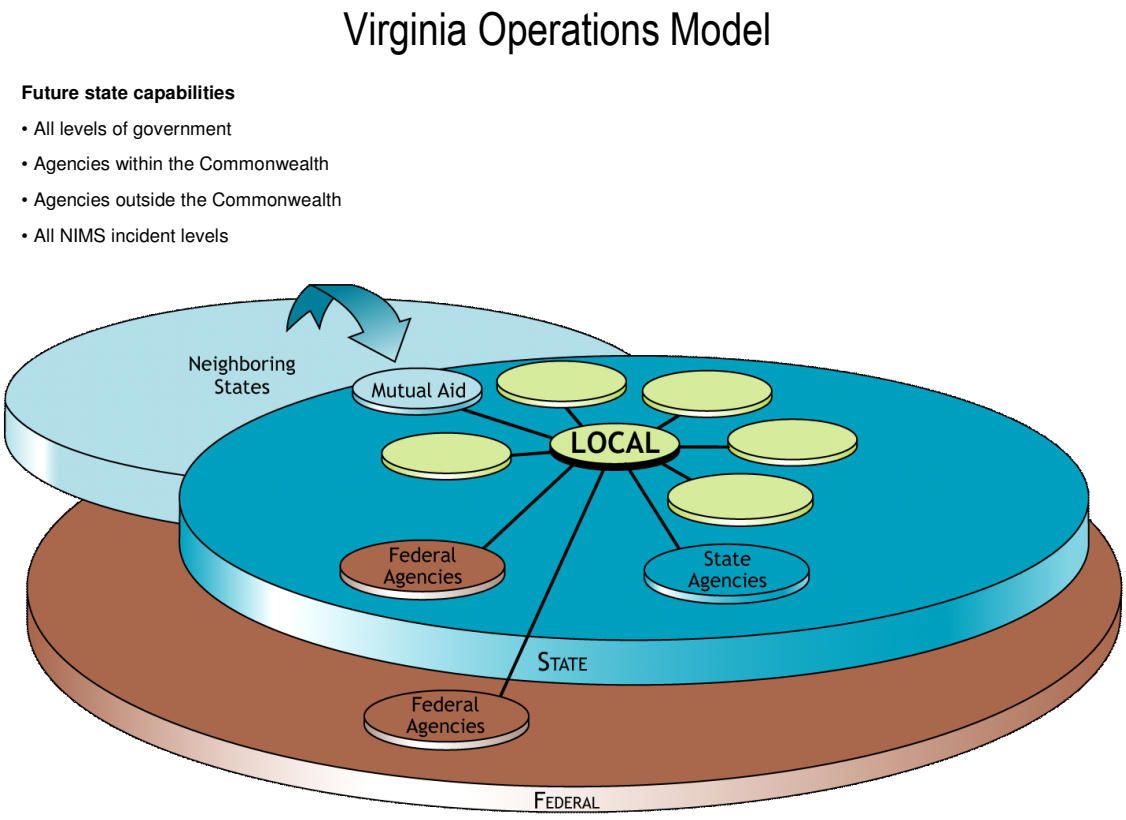
Example: On a daily basis, any local law enforcement first responder can communicate with the VSP troopers (or other state agency personnel) within their home agency's coverage area immediately upon request.

To ensure that the future state capabilities for voice considered all scales of incidents, capabilities were developed for all NIMS Incident Types involving response from agencies across all levels of government. The voice capabilities accounted for a variety of operational needs, including:

- The involvement of local, state, and federal responders as well as mutual aid responders from other states
- Situations involving the need for multi-discipline and multi-jurisdictional voice communications
- The broad-based use of National Interoperability Channels
- Statewide long-haul (long-distance) voice pathways
- Redundant voice communications between local Emergency Operations Centers (EOCs) or Public Safety Answering Points and the Virginia Emergency Operations Center

These voice capabilities characteristics are notionally depicted in Figure 2.

Figure 2. Notional Depiction of the Voice Capabilities

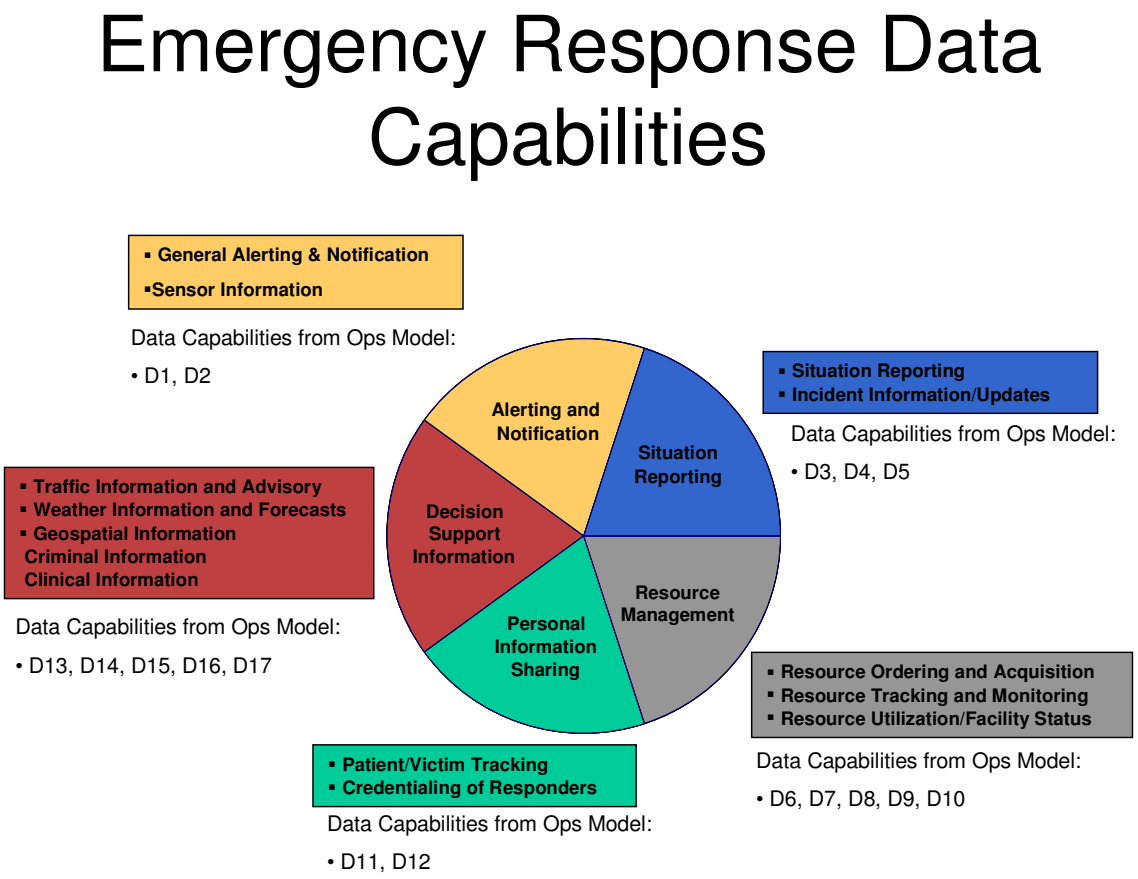


The Ops Model IAT then began the process of addressing future state capabilities for data exchange and information sharing. The data capabilities accounted for a variety of information sharing needs, including:

- Enhancing situational awareness
- Managing resources
- Supporting decision-making
- Sharing personal and personnel information
- Raising alerts

These data capabilities are grouped according to the categories depicted in Figure 3.

Figure 3. Future State Capabilities for Data



The Ops Model IAT also provided input on the development of capabilities for supporting functions. The supporting function capabilities describe resources and processes that provide assistance with decision-making, collaboration, coordination, and planning prior to an incident occurrence. These capabilities are not technical. However, they must be in place and in use, as part of the current operational framework, long before an actual event in order for them to support improved communications interoperability “on-scene”.

Finally, in Section 4, the voice and data capabilities were analyzed to determine their relationship and dependency on the existing initiatives described in the Statewide Plan. The analysis showed that the existing initiatives have the ability to support most of the future state voice and data capabilities; however, technical and operational experts will be asked to conduct further analysis to develop projects plans and design solutions that lead to implementation of the capabilities within their own regions and for statewide planning.

1 INTRODUCTION

1.1 Target Audience

The Ops Model addresses two different audiences: (1) regional and local leaders, such as county commissioners, planners and city managers, who will participate and support long-term interoperability issues and (2) system planners across the Commonwealth who will develop and implement solutions to support the achievement of the desired future state capabilities within their communities.

Regional and local decision-makers and budget planners can use the future state capabilities, defined by the public safety practitioners and emergency responders participating in the IAT, to provide direction to their implementation plans and locally focused operations models. Because more detailed information is provided to complement the Statewide Plan, county and/or city planners can use the Ops Model as a status check and guidance document when they develop local plans for their community. They can determine which capabilities they meet and which capabilities they are not addressing. For capabilities not being addressed, local leaders can begin making plans for bridging these gaps and can align their grant applications or requests to this model.

The direction provided herein will inform the development of technical solutions for the Commonwealth. The Ops Model provides a basic understanding of the desired interoperable capabilities for the Commonwealth by detailing a list of future state capabilities. System planners and technical engineers will use the framework of the desired capabilities and can respond with specific solutions or approaches that help achieve the capabilities.

1.2 Development of the Operations Model

Key Principles for Creating and Using the Operations Model:

The Ops Model IAT members volunteered their time to develop the Ops Model using a set of key principles to guide their process.

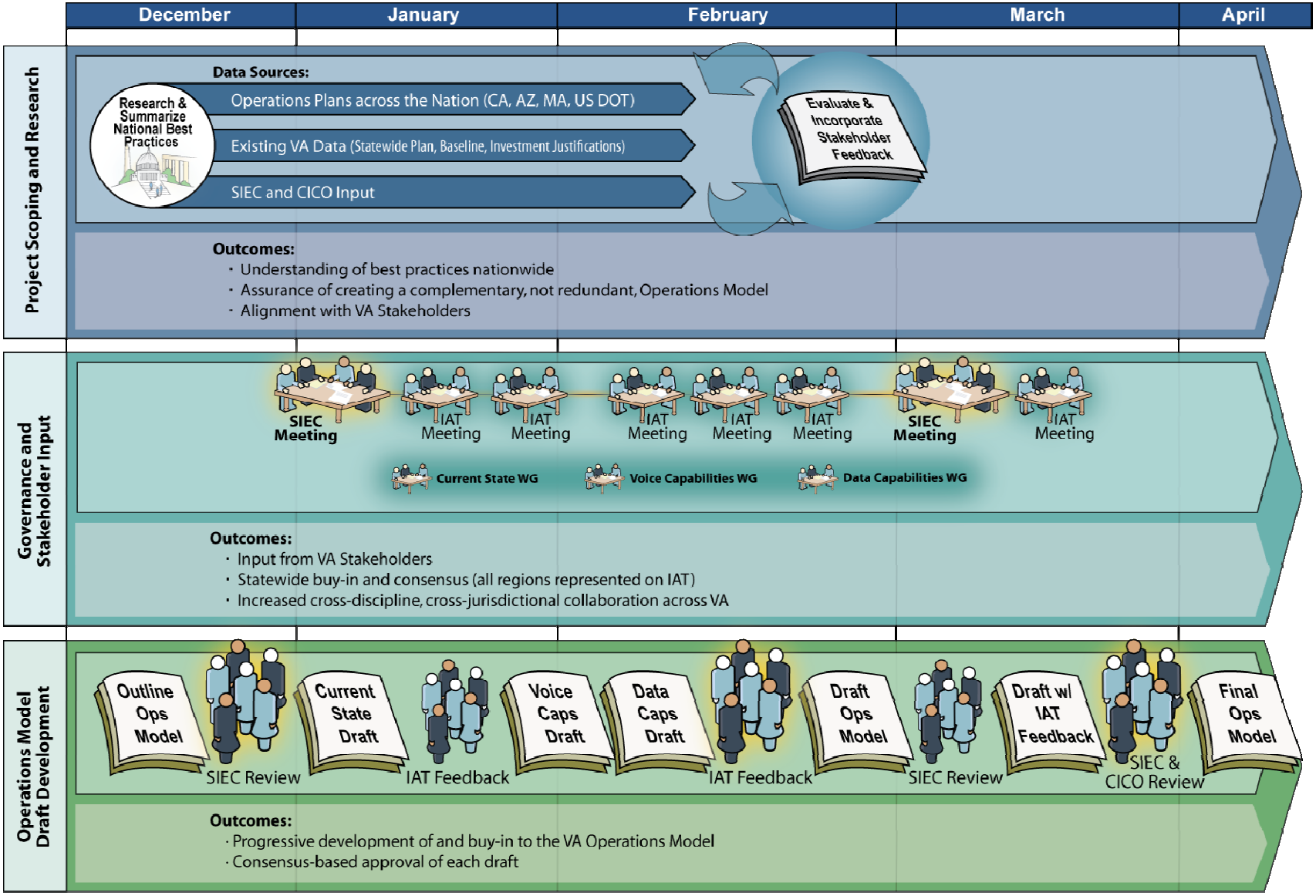
The Ops Model:

- Will be a living document. Updated versions of the Ops Model will be created with the discovery and understanding of new information.
- Must include information from other sources, such as the Statewide Plan (which includes the CoVA initiatives), that have already been created.
- Considers local, regional, state and federal interoperability partners.
- Will require regional representatives to collaborate and think STATEWIDE.
- Does not provide a comprehensive solution to interoperability. The Ops Model provides guidance and direction that can be applied in the design of interoperability projects within Virginia's communities.
- Will help identify and support the efficient allocation and use of resources in the Commonwealth.

Process for Creating the Operations Model

Figure 4 illustrates the process used in creating the Operations Model. This process was completed in three phases: Project Scoping and Research, Governance and Stakeholder Input, and the Operations Model Draft Development. As shown below, the process began in December 2007 and the final document was delivered in April 2008.

Figure 4. VA Ops Model Process and Approach



Project Scoping and Research
The goal of this phase was to take a high-level initiative and scope it down into a meaningful, useful framework. Since an Operations Model had never been developed in the Commonwealth of Virginia, research was done on existing operation plans in other states. The team reached out to representatives in California, Arizona, and Massachusetts regarding their experience with statewide operational plans. An operational document from the U.S. Department of Transportation (DOT) was also reviewed.

In addition to looking outside of Virginia, research was done on available information within the Commonwealth. The Statewide Plan was reviewed with special attention to Initiative 1, which calls for the creation of an Ops Model. The Baseline and Public Safety Interoperable Communications (PSIC) Investment Justifications were examined to ensure that the Ops Model would not be redundant with previous efforts and documents. Additionally, the review existing Virginia information helped ensure alignment with the strategic direction of the Commonwealth.

Throughout this entire phase, feedback was gathered from SIEC members, CICO, and individual stakeholders within Virginia to ensure the Ops Model was properly scoped.

Governance and Stakeholder Input
During this phase of development, there was a focused effort to gather input from Virginia stakeholders. The Ops Model IAT, which included representatives from each of the seven Regional Preparedness Advisory Committee (RPAC)[3] and several state agency representatives, was chartered. Weekly meetings with the IAT served to gather the necessary input and perspective for the Ops Model. Out of the IAT, three working groups formed, each with a specific focus: the current state of the Commonwealth, voice future state capabilities, and data future state capabilities. Insights gathered in these focused working groups were then brought before the larger IAT for feedback and discussion. The SIEC also provided direction and approval when chartering the IAT and at key decision points of this phase.

Operations Model Draft Development
In this phase of development, many drafts were completed and reviewed by the stakeholders. An initial outline of the Ops Model was created, which stemmed from the interviews and input collected in the "Project Scoping and Research" phase. This outline was brought before the SIEC for feedback and upgrades. Moving forward, additional portions were built into the document, such as the current state section (Sec. 2) and voice and data future state capabilities (Sec. 3). Completed Drafts of the Ops Model were delivered to the SIEC for feedback at key review points. With the SIEC feedback, the review of the IAT, and additional stakeholders, the Ops Model Draft was then updated and further refined into a Final Ops Model, which was delivered to the SIEC and CICO for final approval.

[3] These regions are synonymously referenced as the Virginia Homeland Security Planning Regions and Virginia State Police Regions. The map in Appendix 5.3 depicts the borders for each region.

1.3 Operations Model Scope

What is the Operations Model?

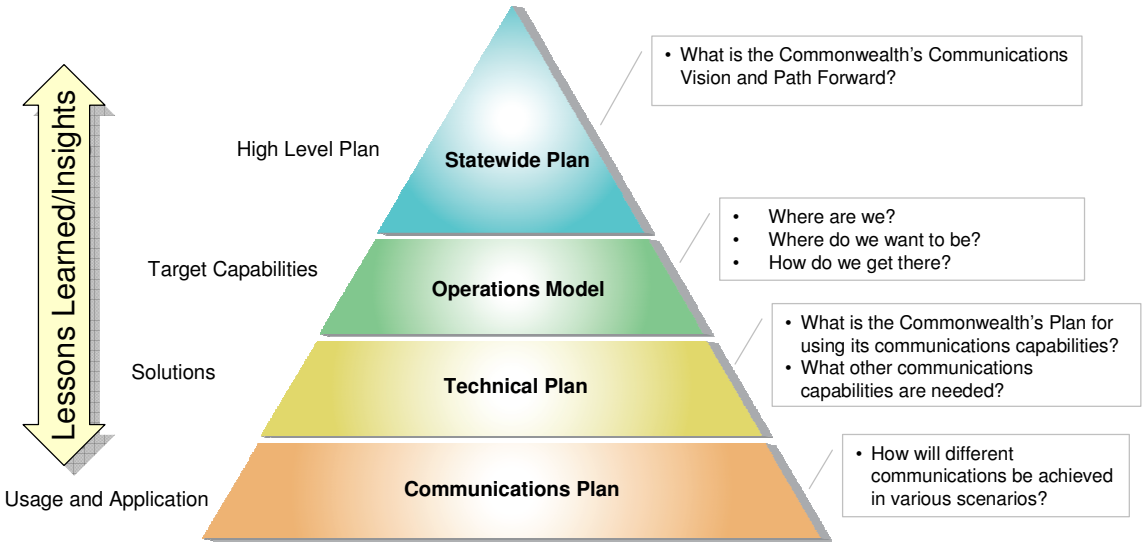
To make full use of the Ops Model, it is vital to understand exactly what it contains. Primarily, the Ops Model is a document that identifies descriptive future state capabilities that the Commonwealth wants to achieve by 2015. The figure below (Figure 5) shows the progression of Virginia planning.

Whereas the existing Statewide Plan offers a high level vision of interoperability in Virginia, the Ops Model takes this vision one level deeper by outlining specific capabilities that the public safety community should possess. Following the creation of the Ops Model, a Technical Plan (Initiative 2)[4] will identify specific solutions to achieve these capabilities. Finally, a Communications Plan will provide an even stronger level of detail by using the capabilities and solutions for specific scenarios.[5]

Figure 5. What is the Ops Model?

<u>Intended purpose</u>

- To help define a path forward for the Commonwealth of Virginia that will lead to the achievement of the 2015 Goals and Objectives outlined in the Statewide Plan.



The Ops Model also provides an analysis on how the future state capabilities relate to the current CoVA initiatives provided in the Statewide Plan. This analysis can be used to determine if the current initiatives are accomplishing (or aiming to accomplish) the needs of the Commonwealth.

[4] For more in-depth information on the Statewide Plan and the initiatives, therein please visit the Commonwealth Interoperability Coordinator Office's website. The Statewide Plan can be found at: http://www.interoperability.virginia.gov/StrategicPlans/index.cfm

[5] The CICO coordinates the development of the Statewide Plan, the Operations Model, and the Technical Plan. The Virginia Department of Emergency Management (VDEM) coordinates the development of the Communications Plan. Representatives from CICO and VDEM ensure information and knowledge is shared in support of their respective efforts.

The CICO understands that strategic planning and implementation are iterative processes. The lessons learned and insights gathered in the development of each building block depicted in Figure 5 will be integrated into future updates of the preceding elements. For example, the Operations Model will not only serve to inform the development of technical solutions and strategies across the Commonwealth, but new suggestions and questions raised by the Ops Model IAT will be taken into consideration in the development of future versions of the Statewide Plan.

What the Operations Model is NOT?

It is also important to understand what is *not* included in the Ops Model. To begin, the Ops Model does not include an individual assessment of each region's (seven Regional Preparedness Advisory Committees') operational needs, capabilities, and gaps. The Ops Model does not propose interoperability solutions. As mentioned in the Key Principles, this document is not a solution manual, rather a descriptive framework and capabilities list that stakeholders from across Virginia can use and apply when planning their projects.

The Ops Model and its list of capabilities should not be confused with technical standards, which denote a specific norm or requirement. Such standards are usually accompanied by stringent engineering specifications and are usually formal documents that establish uniform engineering or technical criteria. In contrast, the Ops Model contains future state capabilities that describe the desired functions and abilities that emergency responders would like to have to help them perform their duties – such as exchanging voice and/or data communications in a seamless environment across agencies and jurisdictions when needed. It does not contain technical specifications for how to achieve these capabilities, nor does it delineate standards for the Commonwealth. CICO encourages each community or region to identify the projects or solutions that will achieve the capabilities described in collaboration and coordination with other regional partners and neighbors.

The Ops Model includes summary information on the current CoVA initiatives; however, it does not include a detailed project or budget plan for each initiative. Further information can be requested from CICO, as this office partners with other Virginia state agencies to accomplish the initiatives.

The Ops Model does not dictate communications procedures in the case of an event or emergency. The Virginia Department of Emergency Management (VDEM) is in the process of creating a document that will accomplish this goal and will use the Ops Model document as a reference. Additionally, the Ops Model should be not confused with the Tactical Interoperable Communications Plans (TICPs) that are being developed elsewhere within the Commonwealth.

Finally, the Ops Model does not provide detailed technology solutions. Instead, this document identifies the operational and communication capabilities that emergency responders desire to support incident response within the Commonwealth.

Using the Operations Model

The Ops Model will be used to inform the **strategic planning** of interoperability within the Commonwealth, such as the development of short and long-term initiatives and updates to the Statewide Plan. The Commonwealth can also use the Ops Model as a common set of specific targets when evaluating grant proposals and/or making funding decisions.

Regions and localities can use the Ops Model as menu of objectives when defining their own desired level of interoperability and when developing their communications architecture. The Ops Model will be helpful to regional and local planners facing investment decisions. Such decision-makers can use the Ops Model to guide their funding and resource allocations and can confirm that their decisions align with the vision of the Commonwealth. Finally, if individual regions and localities choose to create their own operations model, this document can be used as a template or model in that effort.

1.4 Integrating the Operations Model with the Statewide Plan

In fulfillment of Initiative 1 in the *2008 Commonwealth of Virginia Strategic Plan for Statewide Communications Interoperability (Statewide Plan)*, the Operations Model will:

> (1) Briefly outline a current state overview of what exists in the Commonwealth to support communications interoperability,
> (2) define a set of desired future state capabilities in the areas of voice, data, and supporting functions,
> (3) identify how existing, planned, and notional technical initiatives in the Commonwealth relate to each future state capability, and
> (4) analyze gaps in how the technical initiatives in the Statewide Plan help achieve the future state communications interoperability capabilities.

The future state capabilities in the Ops Model provide descriptions for capabilities that would ideally be available in the Commonwealth of Virginia by 2015 to support communications during an incident. These capabilities fill communications interoperability needs and gaps for local, regional, and state level first responders and are in alignment with the Statewide Plan. The Ops Model also provides a high-level analysis of the current CoVA initiatives and their impact on achieving these future state capabilities.

> The current CoVA initiatives analyzed for their support of the future state capabilities include:
>
> - Continue to establish Strategic Technology Reserve (STR) to enhance back-up [or alternate] communications capability within the Commonwealth of Virginia
>   - Referred to as: **STR**
> - Promote the establishment of regional systems of systems and interface with STARS to localities and regions to expand communications among disparate systems
>   - Referred to as: **COMLINC**
> - Support expansion of national interoperability channels in all bands to allow responders to use their home system's radio regardless of location within the Commonwealth of Virginia
>   - Referred to as: **National Interop Channels**
> - Support the expansion, deployment and integration of WebEOC and Geographic Information Systems (GIS) statewide to coordinate incident management data interoperability
>   - Referred to as: **EOC Software and GIS**

2 BACKGROUND: CURRENT STATE OVERVIEW OF SYSTEMS AND RESOURCES

This section provides a high-level overview of interoperability in the Commonwealth, as derived from the *Virginia Baseline Assessment Report (Baseline)*[6] and input from the Ops Model IAT members. Notably, this information is not intended to replace (or supersede) the Baseline. This section serves to provide a summary of the current state of interoperable capabilities and associated challenges based on the guidance of some of Virginia's public safety communications leaders. Getting a shared understanding of the current state overview helped prepare the Ops Model IAT as they delineated a set of desired future state capabilities (Section 3).

Additionally, Section 2.7 identifies and describes existing and planned initiatives underway in the Commonwealth to improve communications interoperability based on the Statewide Plan. Throughout this document, these initiatives are collectively referred to as the CoVA initiatives.

2.1 Overview

The Ops Model IAT members – representing various disciplines and jurisdictions of the Virginia public safety community – analyzed the information in the *Baseline*, dated September 27, 2007, to develop high-level conclusions on the current state of interoperability in the Commonwealth. The Baseline report reflects quantitative summary data on the existing equipment, systems, and technologies in the Commonwealth.

Some members of the IAT identified inaccuracies and shortfalls with the Baseline; these were mostly related to recent upgrades and improvements in certain localities. However, they worked within the limitations of an incomplete picture to move the Ops Model forward. IAT members noted that the Baseline does not emphasize regional approaches for achieving communications interoperability, nor does it identify options for leveraging existing communications hardware for achieving interoperability. Rather, the Baseline serves to capture a representation of where the Commonwealth's communications interoperability resources are located at a specific point in time. Since the completion of the Baseline, communities have continued to make progress on their planned initiatives and new projects have been identified to improve interoperability.

After reviewing the Baseline, IAT members leveraged their own expertise and day-to-day experience with public safety communications to highlight key topic areas. The high-level conclusions from the IAT are organized in this section according to the following five categories:

[6] For a complete list of documents referenced for the creation of the Ops Model, see Appendix 5.4.

- Aging Systems and Equipment
- Operability vs. Interoperability
- Voice Communications
- Mobile Data, Information Systems, and Networks and Infrastructure
- Supporting Elements for Interoperability

2.2 Aging Systems and Equipment

Antiquated systems and aging equipment can escalate maintenance costs and reduce reliability for public safety agencies. One high level conclusion noted by the Ops Model IAT stemmed from the existence of aging systems and equipment within the Commonwealth. According to the Baseline, 12% of the overall respondents indicated that their radio systems were over 21 years old and an additional 24% of the overall respondents reported the age of the systems to be 11-20 years old. While Table 4.8 in the Baseline study indicates that 36% of systems are older than 10 years, some IAT members speculate that fifty percent or more of the infrastructure is aging. Therefore, no matter what the solution or technology that is put in place to achieve the Commonwealth's 2015 goals, aging infrastructure must be acknowledged as a reality. [7]

2.3 Operability vs. Interoperability

IAT members, first and foremost, proposed developing a distinction between operability and interoperability prior to explaining the prevalent issues, or findings, in the current state. Members noted that the lack of operability in some instances could stall the overall statewide interoperability effort. As a result, IAT members agreed that interoperability and operability should both be addressed in order for the Commonwealth to continue to lead the way and build on its present innovations.

The IAT highlighted findings within the Baseline report that show a lack of operability in some parts of the Commonwealth. Some localities are not able to speak to the necessary individuals within their own jurisdictions, much less the jurisdictions of others. This poses a dilemma for public safety and communications leaders trying to address interoperability. They must determine whether to allocate resources for pursuing interoperability initiatives even though basic communication needs are not met. Consequently, stakeholders across the Commonwealth engage in an ongoing debate: How can a locality address the need of talking to those outside of their locality or across disciplines, when the need for talking to those within has not been met? Seemingly, this issue can most likely be resolved only with balanced, parallel efforts to achieve both operability and interoperability.

[7] *Baseline,* p. 33.

2.4 Voice Communications

It is generally agreed that voice communications interoperability varies across the Commonwealth. The Baseline data shows strong interoperability for the Northern Virginia (Region 7) and Tidewater (Region 5), while Southwest Virginia (Region 4) is in the early stages of interoperability. Other regions are in various stages of interoperability according to the SAFECOM Continuum.[8]

The IAT highlighted the following conclusions about voice communications in the Commonwealth:

- There is not a statewide consensus among public safety communications officials for how to prioritize and address the differing requirements related to operability and interoperability.
- The State Interdepartmental Radio System (SIRS) is an important part of statewide interoperability; most localities reporting that they use SIRS.[9]
- For the most part, the localities where 800 MHz is deployed regionally have intra- and inter-jurisdictional interoperability.
- Overall, console patches are the most utilized interoperability solution. The next highest response is gateways of any type, followed by Mobile Command Vehicles.
- Although there are some pockets of interoperability, they are highly regionalized. For example, the Central Virginia area has advanced its interoperable capacities by implementing a shared 800 MHz system amongst the counties of Henrico, Chesterfield and the City of Richmond as well as interoperability paths to Hanover, Powhatan, Petersburg, Hopewell and Prince George from that system. Despite such success in some regions, seamless links across all regions do not currently exist.
    - Weaknesses include region to region as well as sub-region to sub-region interoperability where the lack of cross-regional interoperability stems from geographic obstacles and governance issues. Inconsistent policies and rules from jurisdiction to jurisdiction or region to region, such as local zoning policies, historical factors, national park regulations, and/or quiet zone designations in many jurisdictions for the placement of towers impact progress towards collaboration.
- There is a lack of readily available mobile command units that can be deployed across the Commonwealth. While some funding has been set aside to broaden this resource, early efforts are not fully deployed or not widely available.
    - Additionally, where mobile command units are in place, there is a need for widely supported and trained standard operating procedures. This should include training for personnel who help manage the communications unit function.
- According to the Baseline, those respondents who have trunked radio systems were asked to identify the trunking protocol. The responses from this question highlight a significant factor in the lack of interoperability due to the numerous trunking protocols

[8] The Baseline report used the SAFECOM Continuum to organize the survey and results. For more information on the SAFECOM Continuum, refer to the following website: www.safecomprogram.gov

[9] *Baseline,* p. 10

in use across the state. This relates to the fragmentation caused by the use of disparate vendors or proprietary systems and may point to the need for improved coordination and systems planning.[10]

- There is a lack of communications from local to state agencies. Many localities can communicate to Virginia State Police (VSP) via SIRS (base and mobile radios); however, few local agencies can talk to VSP via portable radios. This can be attributed to the lack of range, reliability, and return on investment of portable radios in the VSP frequency band. There are jurisdictions that have installed frequency specific Base Interface Modules (BIM) in their radio systems which will allow patching to SIRS frequencies with both mobile and portable radio subscriber units in the field.
- There are some communications capabilities available through coordination with Amateur Radio Emergency Services / Radio Amateur Civil Emergency Services (ARES/RACES). These resources can generally provide backup capabilities. Notably, the amateur radio groups aligned with public safety in the Commonwealth operate on the UHF and VHF frequency bands. Three main groups supporting amateur radio are ARES, RACES, and Valley Amateur Radio Association.
- Narrowbanding is an ongoing process that is affecting or will affect many jurisdictions. Over 60% of agencies plan to wait at least 3 years for their switch to narrowband compliance.[11]
- A majority of the respondents to the Baseline (63%) indicated that that they use none of the national interoperability channels. Furthermore, 58% of respondents did not have any interoperability channels programmed into their radios.[12]

Cross Band Repeaters

Cross band repeater systems provide voice interoperability by receiving a radio transmission on one agency's frequency, and rebroadcasting the audio to one or more other agencies on their respective frequencies[13]. Cross band repeater technology continues to improve and should be further evaluated. The State agencies are using cross-band repeaters, but very few localities are using them routinely. In some cases, responders could rely on cross-band repeaters rather than radio caches.

Radio Caches

Currently, the Commonwealth is pursuing a statewide radio cache initiative to ensure a basic level of interoperability among first responders during a multi-discipline, multi-jurisdictional response. Recently, the SIEC established three large type II radio caches in the following localities: Fairfax, Harrisonburg – Rockingham, and Chesapeake. The radios will be in the 800 MHz, UHF and VHF frequency bands, and will be programmed with the national interoperability frequencies. The radios will be a mix of M/A-COM and Motorola radios for trunked radio operation. Each cache will also include infrastructure-based and tactical-based interoperability boxes or gateways.

[10] *Baseline,* p. 30
[11] *Baseline,* p. 32
[12] *Baseline,* p. 51
[13] http://www.policeone.com/police-products/communications/headsets/articles/107784/

While this effort is ongoing with support from the SIEC, at the local level, only 29% of Baseline respondents stated that they maintained radio caches.

2.5 Mobile Data, Information Systems, and Networks and Infrastructure

Mobile Data

There is inconsistency in the level of mobile data capability across the Commonwealth. Some areas have a strong capability, while others do not.

Most communities across the Commonwealth that have a mobile data capability use slow speed connections.

Those who do not have mobile data must work through their agency's dispatchers to gain access to important database information. An example of this limited capability is shown when first responders in the field have to go through their agency's dispatcher to run a records check.

There is limited capability for responders to access this information directly from their vehicles. The implications of this can be prolonged time in receiving information and increased danger to the first responders. Also, without this capability, first responders are not able to communicate with each other using data messages.

Information Systems

The Ops Model IAT sub-group prioritized three application areas for discussion in the realm of Information Systems and Information Sharing. These included Geographic Information System (GIS) mapping software, Emergency Management Software (e.g., WebEOC), and Computer Aided Dispatch (CAD).

Geographic Information System (GIS)

Geographical and location-based information serve public safety and emergency responders by providing them with the ability to visualize and gain situational awareness. The current state of GIS across the Commonwealth has been described by stakeholders as a "patchwork quilt." Moving forward, efforts are being made to centralize this capability under Virginia Geographic Information Network (VGIN), an organization responsible for overseeing the development of a catalog of GIS data available in the Commonwealth. The VGIN Advisory Board was established to facilitate the cost-effective development and use of spatial data, GIS, and related technologies in organizations throughout the Commonwealth and to advise the Division of the Virginia Geographic Information Network on issues which foster the creative utilization of geographic information and oversee the development of a catalog of GIS data available in the Commonwealth. VGIN is developing and recommending policies and/or guidelines to support state and local government exchange, acquisition, storage, use, sharing and distribution of geographic or base

map data and related technologies. Currently, VGIN is undertaking several key initiatives, including:

- Compiling a listing or "data catalog" on the Virginia Metadata Portal consisting of descriptions of GIS coverage maintained by individual state and local government agencies.
- Setting priorities for the development of state digital geographic data and base maps that meet the needs of state agencies, institutions of higher education, and local governments.
- Seeking alignment with the needs of Public Safety and identifying the most common needs across the Commonwealth not covered by Public Safety.
- Establishing Communities of Interest (COINs) for seven prioritized theme areas, with a current focus on two of the areas commonly used: Orthophotography and Transportation. The remaining themes are Hydrography, Cadastral Information, Governmental Units, Elevation, and Geodetic Control.

With these efforts underway, Virginia is making strides towards compiling large sums of GIS data in a centralized location. Moving forward, VGIN will continue working with Virginia Information Technology Agency's (VITA) public safety communications and radio engineering teams to provide geospatial and public safety services to local governments.

Emergency Management Software

According to the Baseline, over 50 percent of the localities do not use emergency management software, except in Region 7.[14] The most common application for emergency management software in the Commonwealth is WebEOC. In many instances communities do not have standardized versions of this application, which impedes data sharing capabilities. Therefore, there are several inconsistencies in the emergency management tools implemented across the Commonwealth caused by the use of multiple software vendor products and mapping applications.

Additional challenges with WebEOC include:

- Only 19% of localities have their own Web EOC
- Only a couple of regions can communicate and share information via WebEOC
- Hospital Web EOC versions do not communicate with local WebEOC's

Computer Aided Dispatch (CAD)

Computer aided dispatch (CAD) systems are widely used across the Commonwealth. According to the Baseline, 65% of the respondents indicated that their CAD systems used a proprietary protocol.[15] The Baseline also indicated that over 13 different software vendor products are being used throughout the Commonwealth (Table 4-29). These facts point to a low compatibility between CAD systems.

[14] *Baseline,* p. 42
[15] *Baseline,* p. 40

Networks and Infrastructure

It is important to understand the current state of data networks and infrastructure because Virginia stakeholders cannot share information, voice or data, between systems without connected systems. The Ops Model IAT noted that there was a lack of clarity on the condition of and progress towards a state-wide linked or linkable infrastructure that can become a conduit for both voice and data. An example is in the Tidewater networks where both wire and microwave are connected. Currently, Virginia is trying to connect that infrastructure to the networks in the Richmond area. Simultaneously, Northern Virginia is looking at ways of linking the existing "institutional networks" (INETs).

2.6 Supporting Elements for Interoperability

Outreach

There are various means, with differing levels of formalization, for circulating information. Some communities in the Commonwealth have strong contacts and networks of people to ensure that information is disseminated to the appropriate contact in a timely manner. Others struggle to galvanize and share information, which results in limited awareness about upcoming opportunities for grants, participation in initiatives, and providing input.

Governance

Collaboration and participation of relevant public safety stakeholders is essential for communities who desire to establish sound interoperability. Some communities are early in this process and need assistance with launching formal governance groups. Currently, the Commonwealth is moving towards establishing an Interoperability Subcommittee for each of the Regional Preparedness Advisory Committees (RPACs). These Subcommittees will likely be a powerful force in coordination and information dissemination in future years. The Interoperability Subcommittees will be helpful in promoting the sharing of lessons learned from region to region, such as the successful process used by the Hampton Roads Interop Group to align the Chief Administrating Officers (CAO) with the public safety communications needs in their community.

Regional Agreements and Operational Procedures

In some communities, the lack of memoranda of understanding (or other agreements) and operational procedures contribute to communications weaknesses and hardware needs. For example, most fire/EMS based systems work daily with other localities out of necessity without formal agreements in place. There is a need to coordinate sub-region and regional managers to develop (if not already developed) basic operational procedures based on daily and risk based assessments. Once these are completed, the procedures can be used to enhance and drive forward the best interoperability communications model.

Frequency and Licensing Issues

Frequencies, or radio spectrum bands, are the pathways on which public safety agencies and emergency responders build voice and data systems or applications transmit information. The process for selecting specific frequencies or frequency bands to use has been, and is being determined by various entities, including individual agencies/localities, vendors, and consultants without a consistent framework or coordination process.

Key barriers and issues impacting frequency usage, licensing, and consequently, system planning in the Commonwealth, include:

- Some communities only have the resources to focus on their individual operability needs
- The lack of a single, statewide, comprehensive repository housing frequency license and usage information (with the exception of the FCC database)
- 800 MHz Rebanding
- Narrowbanding (VHF High Band and UHF)
- 700 MHz Broad banding
- 700 MHz Rebanding
- There is a low percentage of communities across the Commonwealth that have the national interoperability channels actively programmed and in use
- Under the National Public Safety Planning Advisory Committee (NPSPAC) and 700 MHz, localities are required to establish the national interoperability frequencies in their radios; however, there is a lack of similar oversight in the 150 MHz band

In general, there is limited planning, coordination, encouragement, and/or financial incentive for localities to work together when applying for frequency licenses. In fact, most of the collaboration that takes place in acquiring frequencies is done by the locality and the particular vendor from whom the locality is intending to purchase equipment. Consequently, when localities work independently, without communicating or coordinating their upcoming changes, they may create a negative downstream impact on interoperability and systems planning.

The in-depth discussion of the current state provided the foundation for the future state capabilities. Having the increased awareness of capabilities today directed the IAT members to determine ideal capabilities for tomorrow.

2.7 CoVA Initiatives

This section provides details on each of the Commonwealth's initiatives including: a brief description, importance, geographic coverage, first responder coverage, relationship to the other initiatives, and the current status (as of April 2008). Further insight into the existing CoVA initiatives enabled the analysis of the future state capabilities (found in Section 4).

Figure 6. CoVA Initiative Table

Initiative	Description	Why Important	Geographic Coverage	First Responder Coverage (Police, Fire, EMS)	Relationship to other initiatives	Status (as of April 2008)
Strategic Technology Reserve (STR) Radio Cache	Radio Caches can range from 25 radios to 500+ radios and include supporting equipment including transportation, repeaters and tactical gateways.	Radio Caches allow a locality to support outside responders (Feds and other states) who may have incompatible radios by augmenting and/or replacing local radio infrastructure (repeaters, gateways) for tactical situations.	Radio Caches purchased with grant dollars administered by the state are intended to be statewide assets. Other caches may be considered local assets. * *Type 5 caches are by definition only for local use, but can be purchased with grant dollars.*	Law Enforcement Fire EMS	Radios are programmed with national interoperability channels and leverage patching capabilities through tactical gateways, augmented by the Commonwealth's Link to Interoperable Communications (COMLINC) to create cross band, cross protocol communications at the local, regional or federal level.	**Status:** Currently, the awardees are in procurement and integration phase. **Future Direction:** Operations planning in conjunction with VDEM's Virginia Emergency Operations Center (EOC); discussions with numerous radio system operators to gain information to pre-load into radios; intense coordination among three grant teams; documenting the project and process for future efforts **Challenges:** Large amount of specifications to work through on numerous systems; securing procurement mechanisms

Initiative	Description	Why Important	Geographic Coverage	First Responder Coverage (Police, Fire, EMS)	Relationship to other initiatives	Status (as of April 2008)
Regional System of Systems (COMLINC)	Provides a capability to bridge multiple incompatible radio channels. COMLINC is an approach (not a specific vendor or product) for linking local radio systems to STARS using VoIP technology. It also supports bridging disparate local systems.	Allows state agencies (particularly VSP) to communicate with local agencies Allows locals operating on disparate radio systems to communicate with each other Supports a range from day-to-day operations to large scale incidents	Goal is to have this capability statewide Currently exist as multiple regional projects (e.g., Region 1, Lynchburg/Roanoke, Danville, Hampton Roads)	Law Enforcement Fire EMS	COMLINC and the National Interop Channels can be used together to patch state & local operational channels to the national interop channels. It would also allow bridging national interop channels operating on different bands (e.g., VTAC1 patched to UTAC3).	**Status**: Contracts are scheduled to be presented to the vendor by Friday, April 11, 2008. Once the vendor has agreed to language and payment milestones, etc., signatures will complete this phase of the project. There will be two contracts, one from Lynchburg MSA and one from Roanoke MSA. **Future Direction**: Installation moved out until October due to the delay in getting contracts written and MOUs through legal and acceptance by participating jurisdictions. **Challenges**: Formalizing the MOU for participating jurisdictions and getting the required signatures before equipment is installed; organizing the governance committee to oversee the ongoing operation for this project; meeting jurisdictions' expectations with the capabilities of the RIOS interop system; addressing last minute questions & concerns

Initiative	Description	Why Important	Geographic Coverage	First Responder Coverage (Police, Fire, EMS)	Relationship to other initiatives	Status (as of April 2008)
National Interop Channels	This is an initiative to install infrastructure throughout the Commonwealth that operates on FCC designated national interoperability channels (i.e., VTAC, UTAC, ITAC, 700 MHz)	Allows outside responders (Feds and other states) to communicate with Virginia responders Allows responders to bring their own subscriber equipment and communicate anywhere in the Commonwealth Creates a "lowest common denominator" communication capability Supports a range from day-to-day operations to large scale incidents	These are national channels that are to be standardized across the country. They are not designated for wide area (state) coverage. **The objective is to provide a group of frequencies to public safety responders that can be used to administer or deal with local incidents, disasters or events.*	Law Enforcement Fire EMS **These frequencies are for the use of **any** public safety license holder, not just the ones mentioned above.* **In some cases there are discipline specific frequencies which can only be use by that particular discipline.*	COMLINC and the National Interop Channels can be used together to patch state & local operational channels to the national interop channels. It would also allow bridging national interop channels operating on different bands (e.g., VTAC1 patched to UTAC3).	**Status:** The SIEC is encouraging all localities to install National Interop Channels in all radios they have and any that they may purchase. **Future Direction:** Continued installation of National Interop Channels in all state radios **Challenges:** Educating localities on what channel should be used for what incident; statewide training to help jurisdictions identify the correct nomenclature that is available for their use

Initiative	Description	Why Important	Geographic Coverage	First Responder Coverage (Police, Fire, EMS)	Relationship to other initiatives	Status (as of April 2008)
EOC Software/GIS: Crisis Management Software and Common Operating Picture Initiatives	Software designed to provide real-time emergency information to any size Emergency Operations Center or exchange information between Centers and the field.	Supports the ability to track real-time incident information and exchange this information between EOCs throughout the Commonwealth	Statewide	State EOC Local EOCs	The Crisis Management System is one information sharing system that requires interoperability. Others include CAD, GIS, and private partner proprietary information.	**Crisis Management Software:** Operational; undergoing ongoing development **Common Operating Picture:** Scheduled for implementation April 1, 2008 **Common Operating Picture:** Operational deployment is scheduled for June 1, 2008 **Challenges for both systems:** Developing a standard way for all players to access the system; operational usage of the system when an incident happens; training throughout the state; pushing technology growth

3 FUTURE STATE CAPABILITIES FOR 2015

3.1 Definition for Future State Capabilities

To ensure the generation of specific and descriptive capabilities, the Ops Model IAT agreed to use the definition provided below when developing future state capabilities. The definition offered key criteria to cross-check and verify the content of each capability as it was developed.

> **A Future State Capability is a functionality available to first responders or other stakeholders in a given incident type (National Incident Management System (NIMS) Type)[16] in a specific geographic location or area within a given timeframe. Specific to data, the capability should also list out the important data elements/kinds of information of that would be exchanged, such as people, equipment, events, resources, suspect information, etc.**

The future state capabilities generated by the Ops Model IAT are organized under the following categories:

- Voice **(V1.)**
- Data **(D1.)**
- Supporting Capabilities **(S1.)**

[16] A complete description of NIMS Types 1 – 5 can be found in Appendix 5.5.

3.2 Future State Capabilities for Voice

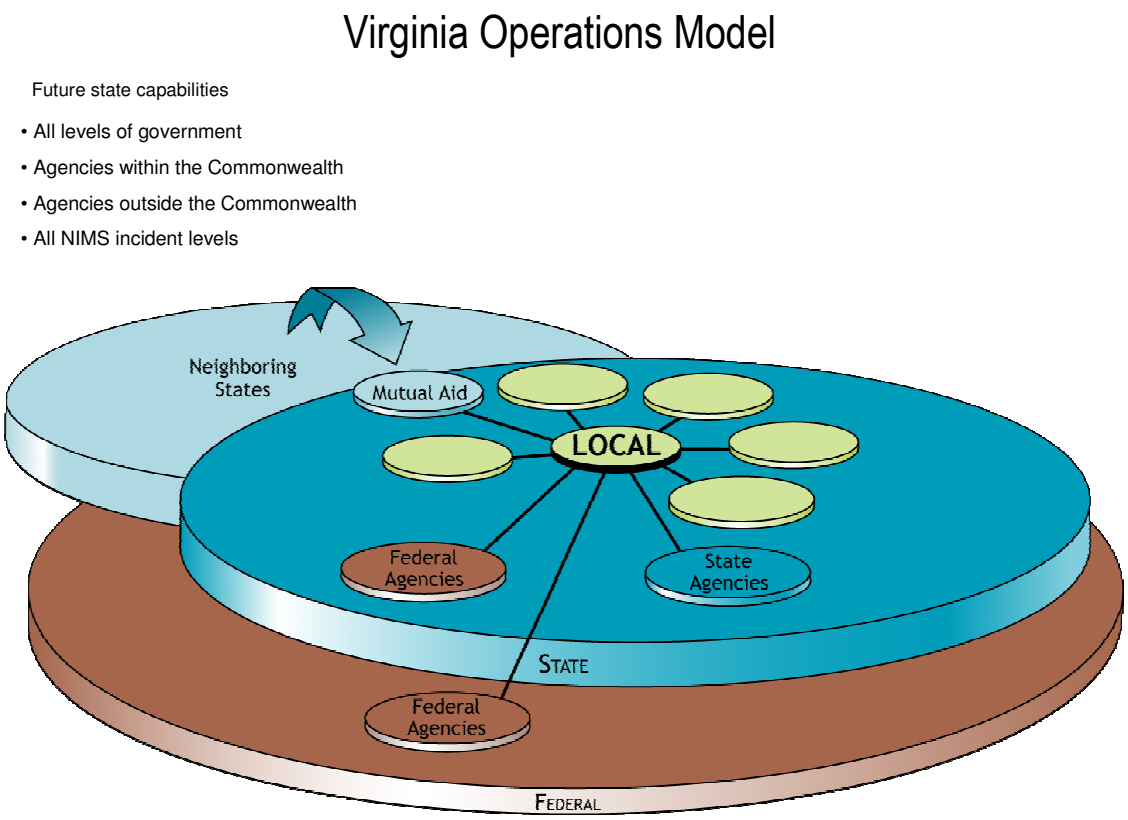
The following table captures the set of future state capabilities for voice communications interoperability established by the Ops Model IAT. These capabilities represent an ideal set of capabilities available to public safety and emergency responders in the Commonwealth by 2015.

Future State Capabilities for Voice
V1. Local agencies have intra-jurisdictional user-to-user and user-to-dispatch center(s) voice interoperability across all disciplines for NIMS Types 1-5 incidents.
V2. Local agencies have voice interoperability capabilities user-to-user and user-to-dispatch center(s) or coordination point(s) for day-to-day use or as needed with all surrounding jurisdictions and State and Federal agencies with established facilities within their jurisdictional borders for NIMS Types 1-4 incidents.
V3. State law enforcement personnel have voice interoperability capabilities user-to-user for day-to-day use or as needed with all local law enforcement personnel in their assigned region/area for NIMS Types 1-5 incidents.
V4. Local, state and federal agency workers assigned to the Commonwealth have voice interoperability capabilities user-to-user and user-to-dispatch center(s)/Command Posts to support a specific incident scene for NIMS Type 3 incidents (e.g., tornado touchdown, multi-day hostage or stand off) established within 4 hours.
V5. Local, state and federal agencies (including Federal, State and Local workers not assigned to the Commonwealth, if called in for mutual aid/expertise) have voice interoperability capabilities user to user and user to dispatch center(s)/Command Post for all responders to an incident established within 24 hours for NIMS Type 2 incidents (incident of regional significance).
V6. Local, state, federal and national mutual aid responders have access to voice interoperability capabilities unit-to-unit and unit-to-dispatch center(s)/Command Post for all responders to the incident within 72 hours for NIMS Type 1 incidents.
V7. All responders, using their own authorized, agency-issued radio, have immediate access to a dispatch center (monitored controlling point) statewide via a National Interoperability Channel – 700, 800, VHF, and UHF – for NIMS Types 1-5 incidents.
V8. There is a statewide long-haul (long-distance) pathway available for use by any jurisdiction, command post, and state agency.
V9. All local EOCs and PSAPs have immediate, redundant voice communications capability with the Virginia Emergency Operations Center and with each other.
V10. Specific to situations requiring the activation of the National Guard, local jurisdictions and state agencies have access to managed, instantaneous regional, statewide, and possibly, national voice emergency communications.[17]

[17] Voice Capabilities 2-9 specifically call out interactions with Virginia state agencies in general, including interaction and participation of the Virginia Department of Military Affairs (VDMA). Voice Capability 10 is needed to ensure consideration of the unique nature and function of the Virginia National Guard (VNG) as a response agency under special circumstances. While the VNG is a tactical component of the VDMA, there are distinct triggers that define the roles and responsibilities and distinguish which component of VDMA can respond to a situation. The VNG has a dual purpose: (1) in national emergencies, it can be federalized by the President and (2) as part of the state mission, the VNG can be activated by the Governor for state active duty to support response to man-made and national disasters. To achieve implementation of Voice Capability 10, policy, regulation, and legislative changes may be required.

The following graphic provides a comprehensive depiction of voice capabilities defined in this Ops Model. The graphic illustrates that the Ops Model includes capabilities involving local, state, and federal agencies, and covers all five NIMS incident types. In the subsequent figures, each capability will be individually depicted in its own conceptual diagram to provide an additional level of detail.

Figure 7. Depiction for all Voice Capabilities



3.3 Detailed Descriptions of the Future State Capabilities for Voice

During the process of developing the future state capabilities, the Ops Model IAT held detailed discussions about the intent and description of each capability, and in some cases, identified possible solutions for achieving the capability. The detailed discussions, captured in the paragraphs below, serve to inform the technical readers of this document on the objective behind each capability In addition, each future state capability in the voice category has an associated graphical representation of the capability described.

These descriptions are provided solely as descriptive guidance; they should not constrain or limit the generation of innovative ideas or solutions for achieving each capability.

V1. Local agencies have intra-jurisdictional user-to-user to user-to-dispatch center(s) voice interoperability across all disciplines for NIMS Types 1-5 incidents.

Capability Description:

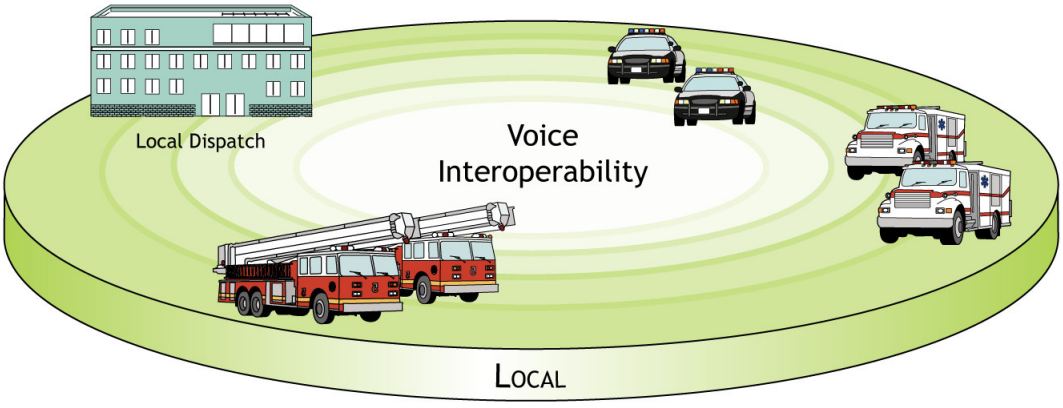
This capability seeks to ensure that first responders from all disciplines have almost immediate user-to-user voice communications with each other within their own jurisdictions by 2015.

The means by which Capability V1 will be achieved may include handheld mobile radios; however, this detail was not explicitly listed in the capability in order to remove technology specific information and allow for multiple solution options.

The stakeholders who developed this capability assumed that some level of progress would occur towards implementing this goal by 2015 even though full implementation may take longer. In addition, the IAT noted the following conditions as important considerations in the technical planning and implementation phase:

- In order for this to be measurable, some level of assessment will be needed prior to moving forward. The level of assessment necessary will be determined during the technical planning phase.
- Consider the regulatory, policy, and legislative changes that will be needed to support the successful achievement of this capability.

Figure 8. Depiction for Voice Capability 1



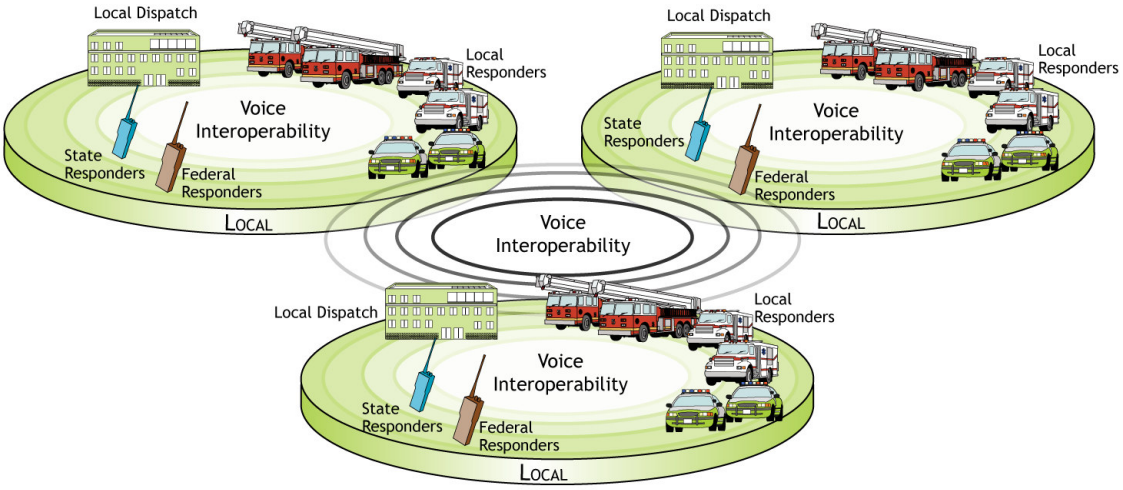
V2. Local agencies have voice interoperability capabilities user-to-user and user-to-dispatch center(s) or coordination point(s) for day-to-day use or as needed <u>with all surrounding jurisdictions</u> and State and Federal agencies with established facilities within their jurisdictional borders for NIMS Types 1-4 incidents.

Capability Description:

This capability refers to a future state where all public safety personnel, be they local, State or Federal, who are assigned or have a facility within a jurisdiction in the Commonwealth, have almost immediate voice communications with each other, within that jurisdiction's borders by 2015. For example, the Virginia State Police and local first responders will be able to communicate during incident response situations almost immediately upon arriving on scene. This capability also includes situations where EMS personnel transporting a patient may need to communicate with their Regional Hospital Coordination Center (RHCC) or where the RHCC may need to communicate with the Incident Commander (IC).

The means by which Capability V2 will be achieved may include handheld mobile radios; however, this detail was not explicitly listed in the capability in order to remove technology specific information and allow for multiple solution options. For example, the RHCC may not need to talk with IC via radio.

Figure 9. Depiction for Voice Capability 2



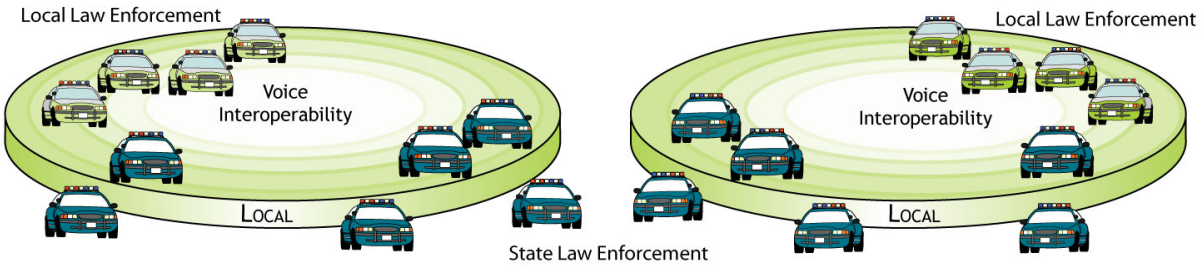
V3. State law enforcement personnel have voice interoperability capabilities user-to-user for day-to-day use or as needed with all local law enforcement personnel in their assigned region/area for NIMS Types 1-5 incidents.

Capability Description:

This capability supports the ability for all police, sheriff, and state police personnel to have almost immediate voice communications with each other by 2015 within the region to which they are assigned. The aim of this capability is to provide law enforcement personnel with the ability for quick response to criminal activity/incidents. This capability includes the State Police, and where necessary, Department of Corrections personnel.

The means by which Capability V3 will be achieved may include handheld mobile radios; however, this detail was not explicitly listed in the capability in order to remove technology specific information and allow for multiple solution options.

Figure 10. Depiction for Voice Capability 3



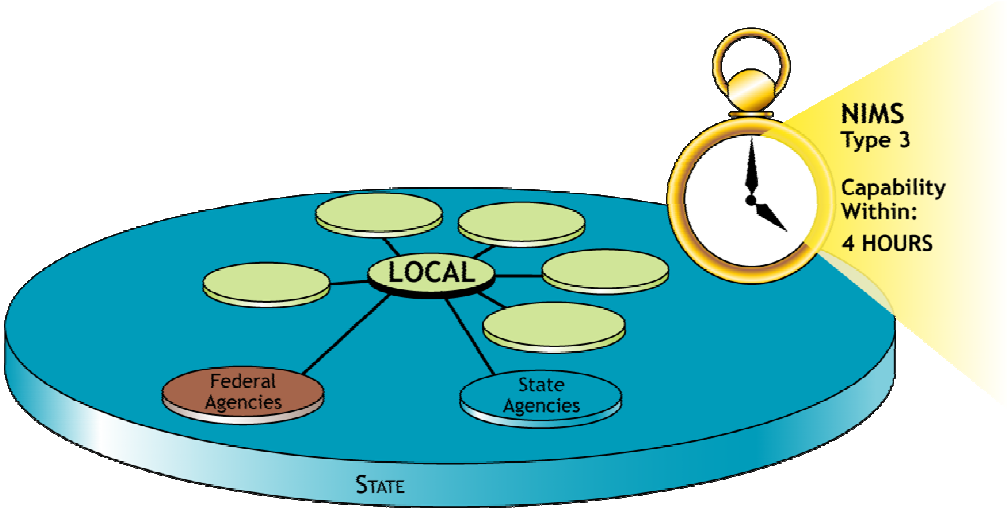
V4. Local, state and federal agency workers assigned to the Commonwealth have voice interoperability capabilities user-to-user and user-to-dispatch center(s)/Command Posts to support a specific incident scene for NIMS Type 3 incidents (e.g., tornado touchdown, multi-day hostage or stand off) established within 4 hours.

Capability Description:

Capability V4 envisions a future state where responders from across the Commonwealth have voice communications in response to a large-scale incident (confined to one site/geographic region) established within 4 hours by 2015. Under this capability, all response agencies have the ability to bridge disparate radio systems and frequency bands within the Commonwealth for NIMS Type 3 incidents.

Possible solution options for achieving Capability V4 include radio cache, interoperability trailers, interoperability audio switches (mobile or fixed), mutual aid channels/talk groups, or patching. Ops Model IAT members did not specifically define a technical solution; however, they suggested that this capability included the need for a strategic reserve capable of providing handheld radios, interoperability devices, and access to larger systems within 4 hours of activation.

Figure 11. Depiction for Voice Capability 4



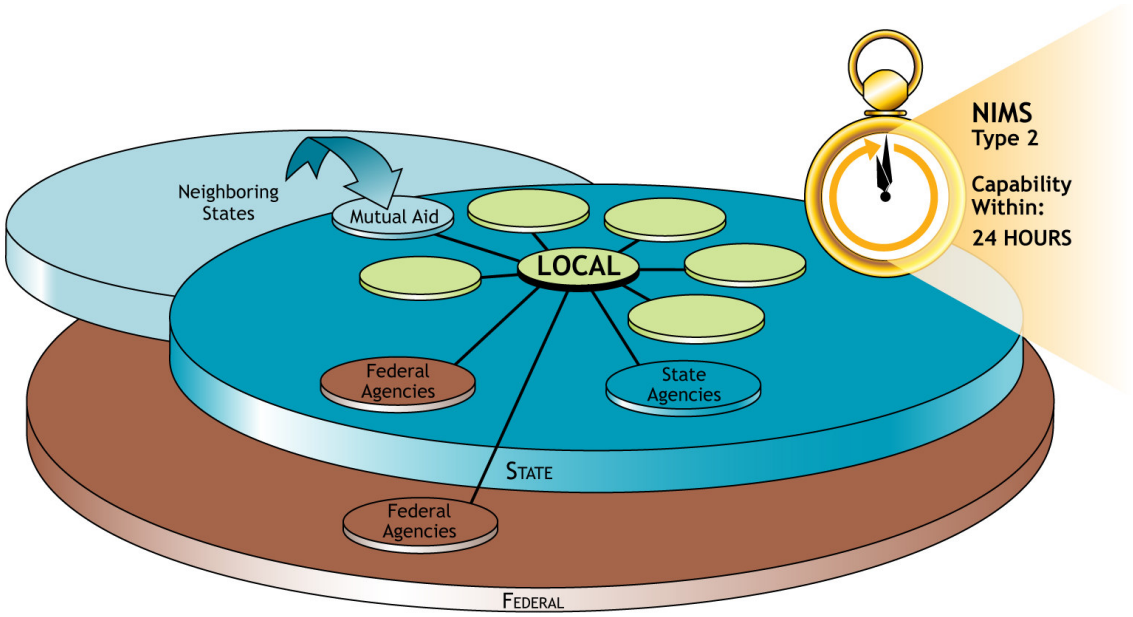
V5. Local, state and federal agencies (including Federal, State and Local workers not assigned to the Commonwealth, if called in for mutual aid/expertise) have voice interoperability capabilities user to user and user to dispatch center(s)/Command Post for all responders to an incident established within 24 hours for NIMS Type 2 incidents (incident of regional significance).

Capability Description:

Under ideal circumstances for this capability, responders from across the Commonwealth and Mid-Atlantic Region (e.g., East Coast localities or states) have voice communications established within 24 hours to support response to a large-scale incident of regional significance (multiple jurisdictions affected).

Possible solution options for achieving Capability V5 include radio cache, interoperability trailers, interoperable audio switches (mobile or fixed), mutual aid channels/talk groups, or patching at multiple sites with many users.

Figure 12. Depiction for Voice Capability 5



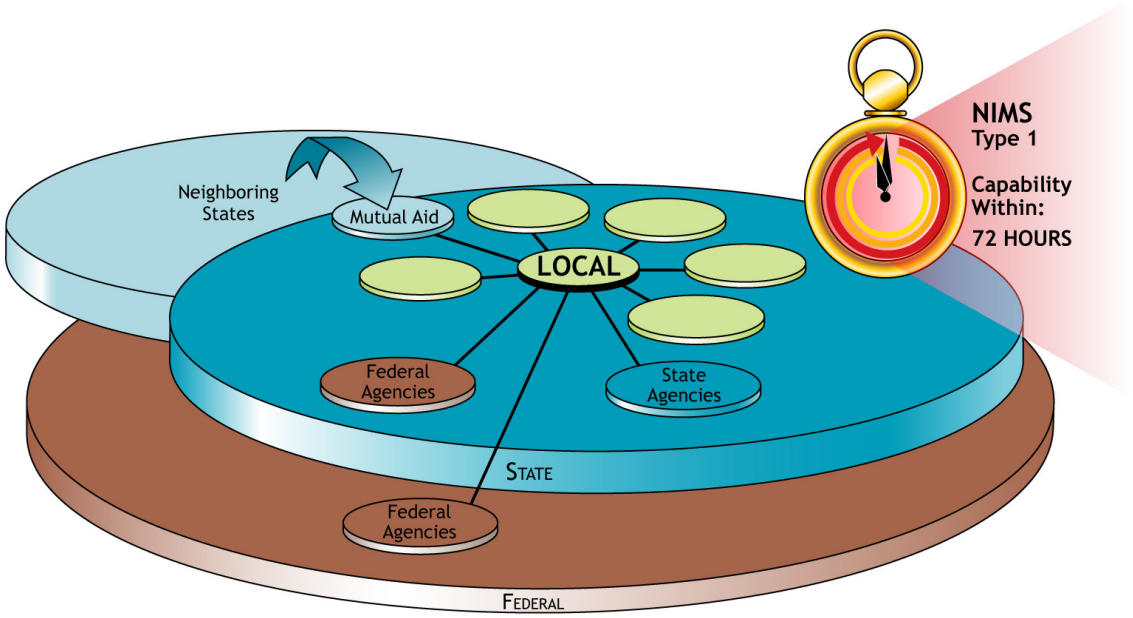
V6. Local, state, federal and national mutual aid responders have access to voice interoperability capabilities unit-to-unit and unit-to-dispatch center(s)/Command Post for all responders to the incident within 72 hours for NIMS Type 1 incidents.

Capability Description:

Responders from across the nation supporting a very large-scale incident (multiple jurisdictions and/or states affected) will have voice communications established within 72 hours. In Capability V6, the expectation is that not everyone will be interoperable with everyone else, but that under the NIMS Incident Command System (ICS) individual responders within a group or unit will be able to talk with their leader and the group leaders will be interoperable with each other.

Possible solution options for achieving Capability V6 include radio cache, interoperability trailers, interoperable audio switches (mobile or fixed), mutual aid channels/talk groups, or patching, short wave, ad-hoc internet protocol (IP) radio systems at multiple sites with many users.

Figure 13. Depiction for Voice Capability 6



V7. All responders, using their own authorized, agency-issued radio, have immediate access to a dispatch center (monitored controlling point) statewide via a National Interoperability Channel – 700 MHz, 800 MHz, VHF, and UHF – for NIMS Types 1-5 incidents.

Capability Description:

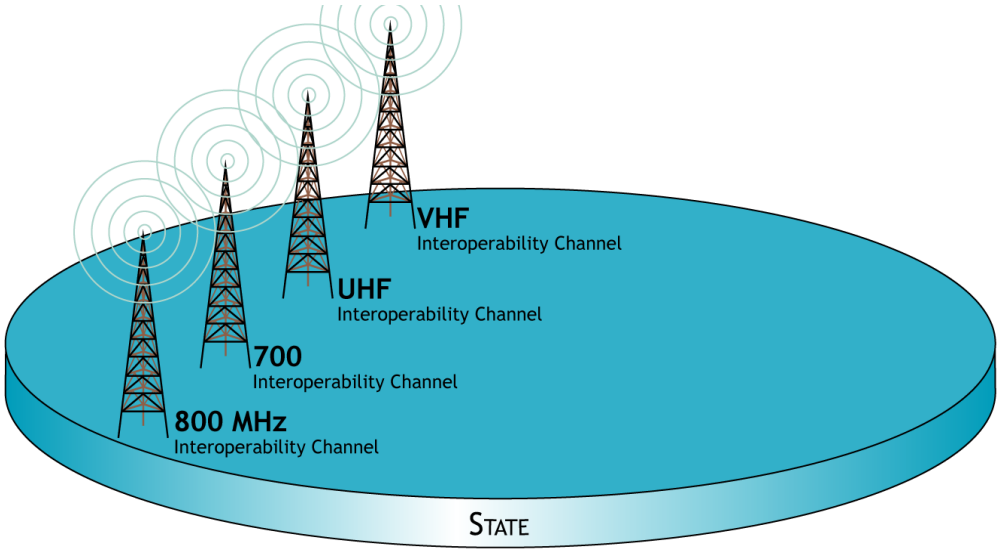
The intention behind Capability V7 is for any responder in the Commonwealth to be able to communicate with any other responder regardless of location using their assigned radios; however, this does not always have to be instantaneous, direct access. These capabilities will be available irrespective of the frequency band of the user or the frequency band of area traversed. Capability V7 also calls for all disciplines to have access to the National Interoperability Channels not only for response, but also to summons help while traveling throughout the Commonwealth. Furthermore, this capability calls for all radios to have designated state, regional mutual aid, and national interoperability channels programmed to support large-scale events immediately upon request.

Hypothetically, this capability indicates that a Fairfax responder traveling through an area in Southwest Virginia may contact a monitored controlling point and request to be linked to his/her agency's dispatch or another responder elsewhere in the Commonwealth.

The Ops Model IAT acknowledges that technical and system planners will have to consider a variety of options with varying cost levels and scope and may need to consider adjusting this capability. Understandably, in the current state, one may have this capability within the area of primary operation, but a responder traveling from Hampton Roads to Southwest on an 800 MHz channel may not be able to achieve this capability. In the future, implementing a solution for this capability could be feasible, but potentially expensive.

Additionally, Capability V7 does not necessarily entail that all first responders have access to every dispatch center. Under the vision for this capability, responders only require access to a single dispatch center, not specifically one belonging to their home agency. Consequently, this capability is achievable using regional solutions or emerging technologies. For instance, there are multi-band radio options or bridging technologies available that do not require an entirely new infrastructure.

Figure 14. Depiction for Voice Capability 7



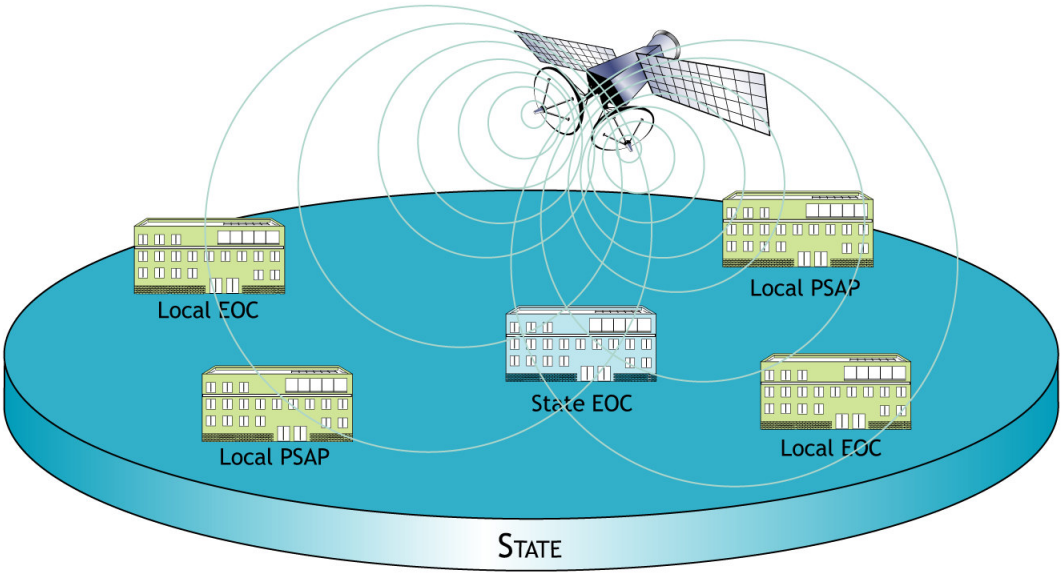
V8. There is a statewide long-haul (long-distance) pathway available for use by any jurisdiction, command post, and state agency.

Capability Description:

This capability calls for an operable and accessible statewide system or "system of systems" to provide coverage for any user, anywhere in the Commonwealth. The achievement of this capability supports multiple applications of long-haul capabilities. For example, this capability supports responders needing to establish communications between area commands and the Department of Forestry or area commands to their respective EOCs. The February 2008 Virginia fires provide a recent example of where this capability may be useful.[18]

The Ops Model IAT participants suggested satellite phones as one method for implementing this capability; however, they acknowledged that satellite phones, as a technical option, are expensive to maintain and keep active. System developers and technical planners in the localities and regions across the Commonwealth may collaborate to identify other innovative approaches to fulfill this capability.

Figure 15. Depiction for Voice Capability 8



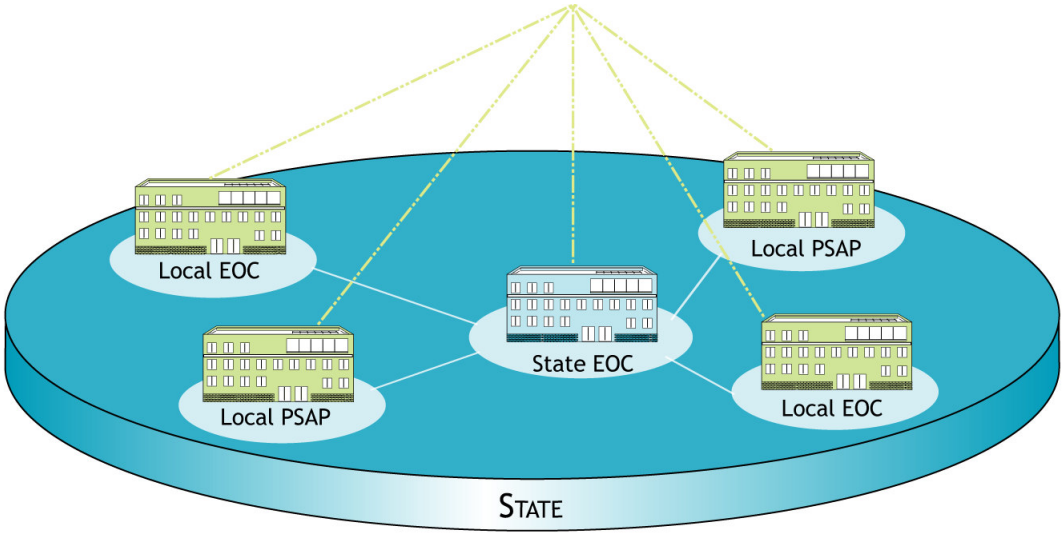
[18] http://www.washingtonpost.com/wp-dyn/content/article/2008/02/11/AR2008021100458.html

V9. All local EOCs and Public Safety Answering Points (PSAPs) have immediate, redundant voice communications capability with the Virginia Emergency Operations Center and with each other.

Capability Description:

Capability V9 focuses on the need for the Virginia EOC to be able to communicate by voice with local EOCs and PSAPs immediately following notification of an event. Communications are necessary to determine the scope and type of incident as well as appropriate support levels to provide. Currently, this type of communication can be achieved via landline telephones; this capability describes the need for a redundant capability that will provide a back-up system to the public telephone system.

Figure 16. Depiction for Voice Capability 9



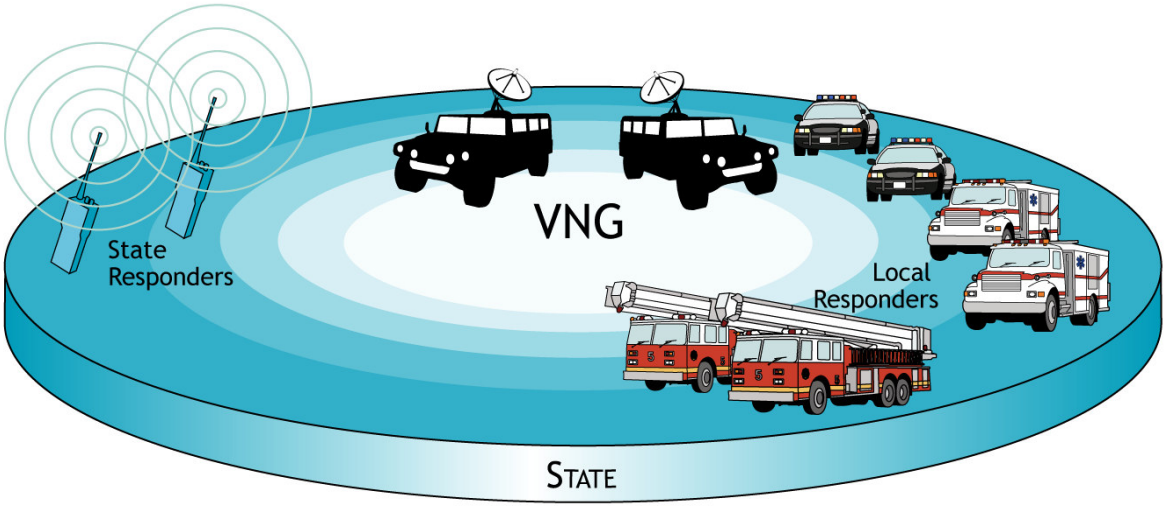
V10. Specific to situations requiring the activation of the National Guard, local jurisdictions and state agencies have access to managed, instantaneous regional, statewide, and possibly, national voice emergency communications.

Capability Description:

The IAT members developing this capability noted the similarity with to V4 and V5; however, they felt the real-time, instantaneous availability component made this unique. The timeframe and stakeholder group identified in this capability warranted different solutions and likely implied the need for additional infrastructure to achieve this capability. Specifically, the unique nature and activation process required to bring the National Guard on scene highlighted the need to keep this capability independent and separate.

As technicians design solution options for this capability, Ops Model IAT members noted that the term "managed" should not necessarily lead to encryption requirements, but should imply ability to authenticate users or "control" who has access to the communications network. Additionally, in order to achieve cost-savings and/or keep the solution design efficient, management issues may be handled through collaboratively developed governance efforts and protocols. Finally, the Ops Model IAT noted that implementation of Voice Capability 10, likely required policy, regulatory, and legislative changes.

Figure 17. Depiction for Voice Capability 10



3.4 Future States Capabilities for Data

The following table captures the set of future state capabilities for **data** communications interoperability. These capabilities represent an ideal set of data and information exchange capabilities available to public safety and emergency responders in the Commonwealth by 2015.

In contrast to the voice capabilities, the scope for the data capabilities proved wider and more difficult to narrow down. The issues with voice have been thoroughly discussed and understood for many years. Alternatively, the realm of data is exponentially more complex and quickly evolving as emerging technologies become available. Furthermore, the data capabilities primarily describe the *information types being exchanged*. As a result, the data capabilities list does not have specific graphics to depict the exchange. Instead, these are organized according to the following five (5) categories:

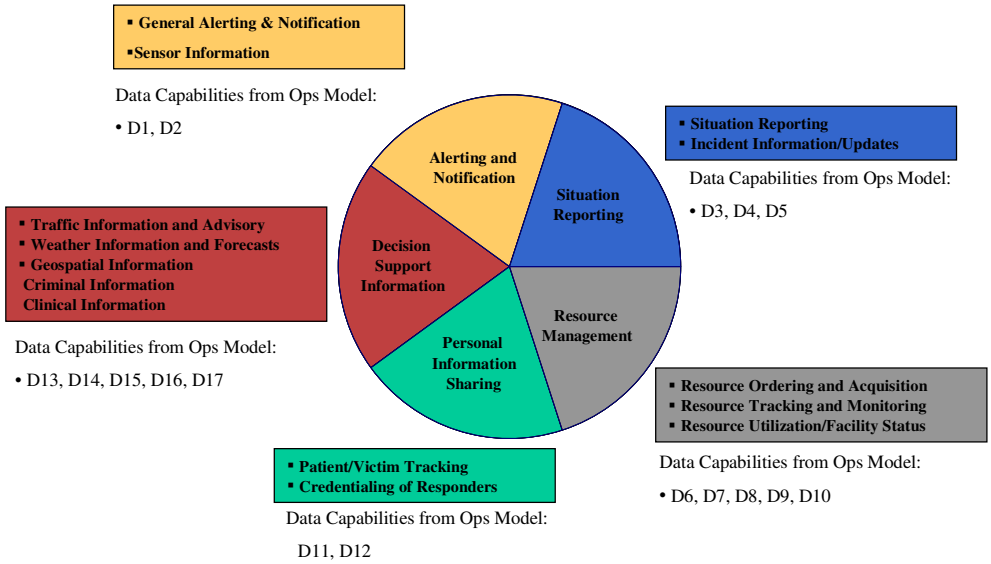
- Raising alerts and sending notifications
- Enhancing situational awareness
- Managing resources
- Sharing personal and personnel information
- Supporting decision-making

Future State Capabilities for Data
D1. All jurisdictions (including Federal agencies) and critical infrastructure partners have the ability to exchange plume modeling and sensor information with the Virginia EOC and local response agencies for NIMS Types 1-4 incidents anywhere in the Commonwealth within 30 minutes.
D2. All agencies within the Commonwealth have the capability to exchange EOC activation updates, incident occurrence information, and traffic advisories with other response agencies, as needed, and with the State EOC for NIMS incident types 1-5 upon incident occurrence.
D3. All jurisdictions have the capability to exchange flood warning and flood level data with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.
D4. All utilities have the capability to exchange outage information with the Virginia EOC for NIMS Types 1-4 incidents anywhere in the Commonwealth.
D5. Local, State and Federal agencies (including federal, state and local workers not assigned to the Commonwealth, if called in for mutual aid/expertise) have the capability to exchange incident information unit-level to Incident Command or EOC(s) and EOCs-to-EOC(s) for NIMS Types 1-2 incidents (large-scale incidents) within 24 hours.
D6. All jurisdictions have the capability to exchange resource availability and tracking information with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.
D7. Local Jurisdictions, VDOT and the Virginia EOC have the capability to exchange traffic and transport related information, to include HAZMAT shipment location information, for NIMS Types 1-5 incidents anywhere in the Commonwealth to provide for display on GIS and Common Operating Picture.
D8. All local EOCs have the capability to exchange shelter status information with the Virginia EOC and others for NIMS Types 1-4 incidents anywhere in the Commonwealth within one hour of activation of the State EOC.
D9. State agencies (specifically the VaNG/VDMA) have the capability to track the location of their personnel anywhere in the Commonwealth at any given time for NIMS Types 1-4 incidents.

Future State Capabilities for Data
D10. Specialized regional response teams (HAZMAT, civil support teams, Search and Rescue, etc.) have mobile data exchange capabilities unit-to-unit, unit-to-dispatch center/EOC for NIMS Types 1-4 incidents within all jurisdictions as needed/on demand. The data exchanged is in support of incident mitigation/response.
D11. All jurisdictions have the capability to exchange incident information necessary to support incident mapping with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.
D12. All jurisdictions have the capability to receive weather related information from the National Weather Service for NIMS Types 1-5 incidents.
D13. The Virginia EOC will have the capability to integrate federal products, including those from the Department of Defense, with its products for NIMS Types 1-5 incidents at any given time and provide them to state agencies and localities.
D14. Federal and state response agencies have the capability to instantaneously export common operating picture information to federal customers in a usable format for NIMS Types 1-5 incidents.
D15. Police, sheriff, and other law enforcement agencies and dispatch center(s) have data exchange capabilities with each other for NIMS Types 1-3 incidents within their jurisdictions and with surrounding jurisdictions as needed/on demand.
D16. All agencies within the Commonwealth have the capability to verify personnel credentials during incident response situations NIMS incident types 2-5 within four hours.
D17. All agencies within the Commonwealth (as allowed by the Health Insurance Portability and Accountability (HIPPA) Act regulations*)* have the capability to exchange patient/victim information for NIMS incident types 1-5 within 4 hours.

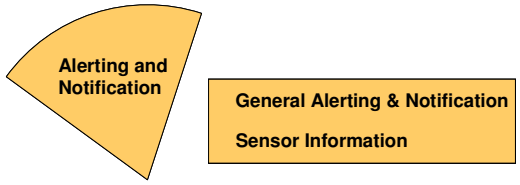
The data capabilities are categorized according to the five areas depicted in Figure 18.

Figure 18. Future State Capabilities for Data



3.5 Detailed Descriptions of the Future State Capabilities for Data

During the process of developing the future state capabilities, the Ops Model IAT provided a few additional details for each capability. These descriptions solely guidance about the applications that may be used to achieve the capability, and they should not constrain or limit the generation of innovative ideas or solutions.



D1. All jurisdictions (including Federal agencies) and critical infrastructure partners have the ability to exchange plume modeling and sensor information with the Virginia EOC and local response agencies for NIMS Types 1-4 incidents anywhere in the Commonwealth within 30 minutes.

Capability Description:

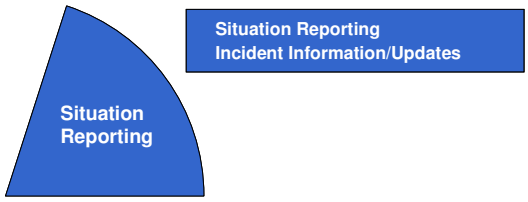
This capability may be achieved using file attachments to WebEOC or files attached to other alert and warning systems. (Note: The Commonwealth of Virginia recently began implementation of the Statewide Alerting Network (SWAN) effort for emergency text-based communication with first responders and for citizen warning. This effort also aims to provide the capability to exchange files or links to files.)

D2. All agencies within the Commonwealth have the capability to exchange EOC activation updates, incident occurrence information, and traffic advisories with other response agencies, as needed, and with the State EOC for NIMS incident types 1-5 upon incident occurrence.

Capability Description:

Specific examples of data exchanges enabled by this capability, or that could be enhanced by this capability, include:

- Statewide Alerting System - ***https://swan.vdem.virginia.gov/index.php?CCheck=1***
- Virginia Criminal Information Network (VCIN) – ***http://www.vsp.state.va.us/CJIS_VCIN.shtm***
- Emergency Management Network (EMNet) – A satellite based warning system that can send messages to individual stations or a group of stations in a secure environment. EMNet can activate a station's emergency alert system (EAS) with EAS messages. Currently, VEOC uses EMNet for Emergency Broadcast System messages and amber alerts, but it is not available to every jurisdiction in Virginia at this time. The long haul satellite project VDEM is developing may allow for the capability to have EMNet embedded in the satellite signal, pending appropriate equipment compatibility.



D3. All jurisdictions have the capability to exchange flood warning and flood level data with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.

Capability Description:

Achieving the exchange of flood warning and flood level data may involve an integration of weather service information and IFLOWS (or other similar products). The Ops Model IAT acknowledges that not all jurisdictions currently have IFLOWS devices, but noted that achieving this capability is possible as long as jurisdictions have access to the information.

D4. All utilities have the capability to exchange street level outage information with the Virginia EOC for NIMS Types 1-4 incidents anywhere in the Commonwealth.

Capability Description:

This information may include outage feeds directly from utilities to State EOC and data providing a visual representation of outages. The capability will enable responders and public safety personnel to access street level details on power outages in addition to quantitative assessments on the number of customers who are out of power.

D5. Local, State and Federal agencies (including federal, state and local workers not assigned to the Commonwealth, if called in for mutual aid/expertise) have the capability to exchange incident information unit-level to Incident Command or EOC(s) and EOCs-to-EOC(s) for NIMS Types 1-2 incidents (large-scale incidents) within 24 hours.

Capability Description:

This capability involves data exchange between units, incident command and EOCs, and includes responders from outside the Commonwealth. This capability is important towards providing situational awareness during response to large scale incidents that involve local and state responders as well as federal responders and mutual aid responders from other states.

D6. All jurisdictions have the capability to exchange resource availability and tracking information with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.

Capability Description:
This capability may be achieved using WebEOC Resource Tracker throughput integrated with GIS information to create the Common Operating Picture (COP). CICO and the SIEC remain open to other options that support this capability. However, at the moment, this capability aligns to the current CoVA initiative to support the expansion, deployment and integration of WebEOC and Geographic Information Systems (GIS) statewide.

D7. Local jurisdictions, VDOT, and the Virginia EOC have the capability to exchange traffic and transport related information, to include HAZMAT shipment location information, for NIMS Types 1-5 incidents anywhere in the Commonwealth to provide for display on GIS and Common Operating Picture.

Capability Description:

Notably, this capability is multi-faceted in the stakeholder groups involved and will require public-private sector collaboration and coordination. This data capability may include data from traffic cameras, temperature sensors, construction status updates, and evacuation route monitoring. This capability also focuses on tracking major shipments, especially radiological or hazardous material shipments.

D8. All local EOCs have the capability to exchange shelter status information with the Virginia EOC and others for NIMS Types 1-4 incidents anywhere in the Commonwealth within one hour of activation of the State EOC.

Capability Description:

This capability may be achieved through the shelter board of WebEOC.

D9. State agencies (specifically the VaNG/VDMA) have the capability to track the location of their personnel anywhere in the Commonwealth at any given time for NIMS Types 1-4 incidents.

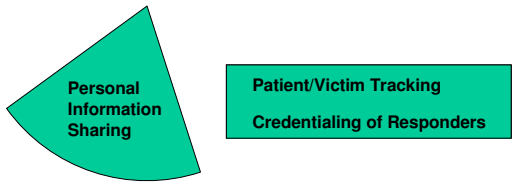
Capability Description:

This capability may be achieved through Blue Force Tracking applications, where the data comes from USNORTHCOM Blue Force Tracker.

D10. Specialized regional response teams (HAZMAT, civil support teams, etc.) have mobile data exchange capabilities unit-to-unit, unit-to-dispatch center/EOC for NIMS Types 1-4 incidents within all jurisdictions as needed/on demand. The data exchanged is in support of incident mitigation/response.

Capability Description:

The data exchanged is in support of incident mitigation/response. This includes data for hazardous materials activity/incidents, GIS, Tier II reports, Material Safety Data Sheets (MSDS), and other data necessary to mitigate the incident.



D11. All agencies within the Commonwealth have the capability to verify personnel credentials during incident response situations NIMS incident types 2-5 within four hours.

Capability Description:

Specific examples of how this capability supports data exchanges include:

- Granting role based access to incident scenes
- Enabling first responders to coordinate credentialing activities (certifications, training, ID, etc.) with relevant parties
- First Responder Access Card credentialing systems (some of which are already underway in the Commonwealth) based on the ability to deploy readers across the Commonwealth

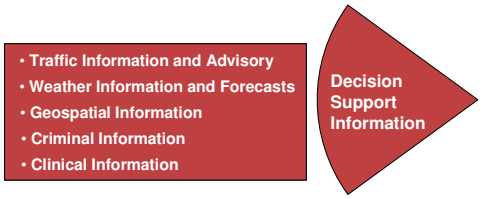
D12. All agencies within the Commonwealth (as allowed by the Health Insurance Portability and Accountability (HIPPA) Act regulations) have the capability to exchange patient/victim information for NIMS incident types 1-5 within 4 hours.

Capability Description:

This capability maintains its focus on the communications component among emergency response personnel and first responders in the Commonwealth. Additionally, efforts to implement this capability must adopt the principles of HIPPA compliance.

Specific examples of these data exchanges include:

- Sharing emergency health record/history
- Determining next of kin/relatives for notification
- Patient triage (Patient #5 in Hospital 3) and tracking (patient specific information that is usually sensitive in nature and governed by HIPPA regulations, as the Pre-hospital Patient Care Reports (PPCR))



D13. All jurisdictions have the capability to exchange incident information necessary to support incident mapping with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.

Capability Description:

This capability envisions the use of WebEOC or other exchange methods to provide incident throughput to GIS and the Common Operating Picture. Data elements to exchange include Incident Status (Open/Closed) and the "who, what, when, where, and why" type of information that supports incident response and decision-making.

D14. All jurisdictions have the capability to receive weather related information from the National Weather Service for NIMS Types 1-5 incidents.

Capability Description:

The data exchanges include storm watches and warnings, precipitation information and predictions, as well as radar and storm modeling information. This capability may also include integration of Hurrevac or other weather prediction tools.

D15. The Virginia EOC will have the capability to integrate federal products, including those from the Department of Defense, with its products for NIMS Types 1-5 incidents at any given time and provide them to state agencies and localities.

Capability Description:

Federal agencies partnering with the Commonwealth may include the Global Command and Control Systems-Joint (GCCS-J), the Federal Aviation Agency (FAA), among others into the efforts to create a Common Operating Picture.

D16. Federal and state response agencies have the capability to instantaneously export common operating picture information to federal customers in a usable format for NIMS Types 1-5 incidents.

Capability Description:

There are several options for how the Commonwealth can achieve this capability. Currently under development as an initiative in the Statewide Plan, the Commonwealth can leverage the WebEOC and integrated GIS projects along with other technical solutions.

D17. Police, sheriff, and other law enforcement agencies and dispatch center(s) have data exchange capabilities with each other for NIMS Types 1-3 incidents within their jurisdictions and with surrounding jurisdictions as needed/on demand.

Capability Description:

The data exchanged is any type of information useful in criminal checks or of a crime prevention nature (mug shots, finger prints, license checks). Additionally, this may include multi-discipline personnel exchanging data, as authorized, within appropriate policy and regulations.

3.6 Future State Capabilities for Supporting Functions

The capabilities identified for voice and data were created to provide functionality or resources to emergency responders and public safety personnel during an incident or event. In addition, the Ops Model IAT identified a set of supporting function capabilities that describe resources and processes that provide underlying support for decision-making, collaboration, coordination, and planning prior to an incident occurrence. These capabilities are part of the operational framework that assist first responders in achieving improved communications interoperability "on-scene." They must be in place and in use long before an actual event to successfully support the achievement of the voice and data capabilities described above. At the moment, these capabilities do not have additional supporting descriptions.

Future State Capabilities for Supporting Functions
S1. Public safety communications systems managers and planners have access to a secure, centralized database to develop communications plan, technical plans, and strategic documents for the State and for use in their localities.
S2. Local, State and Federal agencies within the Commonwealth have established Memorandums of Understanding (MOUs) regarding radio interoperability and governance models that will be used to provide ongoing support during the implementation of equipment/systems, policies and training.
S3. Local, State and Federal agencies within the Commonwealth participate in interoperability planning through an established and open governance model that promotes input and consensus from all involved partners, across all disciplines, jurisdictional boundaries and levels of government.
S4. Local, State and Federal agencies distribute approved policies and provide training for front line personnel on these policies.
S5. Consensus on interoperability policies is needed by 2015 to effectively address interoperable solutions for all situations of differing scales (NIMS Types 1-5) and specific situations that are reoccurring (pursuits, requesting radio interoperability solutions outside of the requestors' jurisdiction or region, etc.).
S6. Communities evaluate whether their policies adhere to the established goals of the Strategic Plan and Ops Model and determine the appropriate mitigation steps when planning and strategic alignment is not in place.

4 ANALYSIS

4.1 Analysis of the CoVA Initiatives with the Future State Capabilities

In this section of the Ops Model a high-level analysis is provided of the future state capabilities and their relationship to current CoVA initiatives. This analysis helps determine how well the current initiatives help achieve the future state capabilities and identify additional efforts needed to facilitate the implementation of the future state capabilities.

Analysis of Voice Capabilities with the CoVA Initiatives

The following table depicts the relationship between the voice capabilities and the existing CoVA initiatives. An "X" indicates that the initiative **directly** supports the achievement of the capability and an "O" indicates an **indirect** relationship between the initiative and the capability.

Figure 19. Analysis Table of Voice Capabilities with CoVA Initiatives

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
V1. Local agencies have intra-jurisdictional user-to-user to user-to-dispatch center voice interoperability across all disciplines for NIMS Types 1-5 incidents.	O		O		
V2. Local agencies have voice interoperability capabilities user-to-user and user-to-dispatch center(s) or coordination point(s) for day-to-day use or as needed with all surrounding jurisdictions and State and Federal agencies with established facilities within their jurisdictional borders for NIMS Types 1-4 incidents.	X	O	X		
V3. State law enforcement personnel have voice interoperability capabilities user-to-user for day-to-day use or as needed with all local law enforcement personnel in their assigned region/area for NIMS Types 1-5 incidents.	X		X		

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
V4. Local, state and federal agency workers assigned to the Commonwealth have voice interoperability capabilities user-to-user and user-to-dispatch center(s)/command posts to support a specific incident scene for NIMS Type 3 incidents (e.g., tornado touchdown, multi-day hostage or stand off) established within 4 hours.	O	X	X		
V5. Local, state and federal agencies (including Federal, State and Local workers not assigned to the Commonwealth, if called in for mutual aid/expertise) have voice interoperability capabilities user to user and user to dispatch center(s)/Command Post for all responders to an incident established within 24 hours for NIMS Type 2 incidents (incident of regional significance).	O	X	X		
V6. Local, state, federal and national mutual aid responders have access to voice interoperability capabilities unit-to-unit and unit-to-dispatch center(s)/Command Post for all responders to the incident within 72 hours for NIMS Type 1 incidents.	X	X	X		
V7. All responders, using their own authorized, agency-issued radio, have immediate access to a dispatch center (monitored controlling point) statewide via a National Interoperability Channel – 700, 800, VHF, and UHF – for NIMS Types 1-5 incidents.	X		X		
V8. There is a statewide long-haul (long-distance) pathway available for use by any jurisdiction, command post, and state agency.	O				
V9. All local EOCs and PSAPs have immediate, redundant voice communications capability with the Virginia Emergency Operations Center and with each other.					

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
V10. Specific to situations requiring the activation of the National Guard, local jurisdictions and state agencies have access to managed, instantaneous regional, statewide, and possibly, national voice emergency communications.	X	X	X		

Analysis of Data Capabilities with the CoVA Initiatives

The following table depicts the relationship between the data capabilities and the exiting CoVA initiatives. An "X" indicates that the initiative **directly** supports the achievement of the capability and an "O" indicates an **indirect** relationship between the initiative and the capability.

Figure 20. Analysis Table of Data Capabilities with CoVA Initiatives

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
D1. All jurisdictions (including Federal agencies) and critical infrastructure partners have the ability to exchange plume modeling and sensor information with the Virginia EOC and local response agencies for NIMS Types 1-4 incidents anywhere in the Commonwealth within 30 minutes.					X
D2. All agencies within the Commonwealth have the capability to exchange EOC activation updates, incident occurrence information, and traffic advisories with other response agencies as needed, and the State EOC for NIMS incident types 1-5 upon incident occurrence.				X	X
D3. All jurisdictions have the capability to exchange flood warning and flood level data with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.				0	X
D4. All utilities have the capability to exchange outage information with the Virginia EOC for NIMS Types 1-4 incidents anywhere in the Commonwealth.				X	X

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
D5. Local, State and Federal agencies (including federal, state and local workers not assigned to the Commonwealth, if called in for mutual aid/expertise) have the capability to exchange incident information unit-level to Incident Command or EOC(s) and EOCs-to-EOC(s) for NIMS Types 1-2 incidents (large-scale incidents) within 24 hours.				X	X
D6. All jurisdictions have the capability to exchange resource availability and tracking information with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.				X	X
D7. Local Jurisdictions, VDOT and the Virginia EOC have the capability to exchange traffic and transport related information, to include HAZMAT shipment location information, for NIMS Types 1-5 incidents anywhere in the Commonwealth to provide for display on GIS and Common Operating Picture.				X	X
D8. All local EOCs have the capability to exchange shelter status information with the Virginia EOC and others for NIMS Types 1-4 incidents anywhere in the Commonwealth within one hour of activation of the State EOC.				X	X
D9. State agencies (specifically the VaNG/VDMA) have the capability to track the location of their personnel anywhere in the Commonwealth at any given time for NIMS Types 1-4 incidents.					X

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
D10. Specialized regional response teams (HAZMAT, civil support teams, Search and Rescue (SAR), etc.) have mobile data exchange capabilities unit-to-unit, unit-to-dispatch center/EOC for NIMS Types 1-4 incidents within all jurisdictions as needed/on demand. The data exchanged is in support of incident mitigation/response.				X	X
D11. All agencies within the Commonwealth have the capability to verify personnel credentials during incident response situations NIMS incident types 2-5 within four hours.				O	
D12. All agencies within the Commonwealth (as allowed by the Health Insurance Portability and Accountability (HIPPA) Act regulations) have the capability to exchange patient/victim information for NIMS incident types 1-5 within 4 hours.				O	
D13. All jurisdictions have the capability to exchange incident information necessary to support incident mapping with the Virginia EOC and others for NIMS Types 1-5 incidents anywhere in the Commonwealth at any given time.				X	X
D14. All jurisdictions have the capability to receive weather related information from the National Weather Service for NIMS Types 1-5 incidents.					X
D15. The Virginia EOC will have the capability to integrate federal, including Department of Defense, products for NIMS Types 1-5 incidents at any given time and provide them to state agencies and localities.					X

Future State Capability	Gateway Audio Bridge (COMLINC or similar)	Strategic Reserve (includes tactical gateways and radio caches)	National Interop Channels	EOC Software	GIS
D16. Federal and state response agencies have the capability to instantaneously export Common Operating Picture information to federal customers in a usable format for NIMS Types 1-5 incidents.				X	X
D17. Police, sheriff, and other law enforcement agencies and dispatch center(s) have data exchange capabilities with each other for NIMS Types 1-3 incidents within their jurisdictions and with surrounding jurisdictions as needed/on demand.					0

4.2 Gaps between the Future State Capabilities and CoVA Initiatives

In reviewing the impact of the existing CoVA initiatives on the future state capabilities, the Ops Model IAT noted potential gaps and additional needs that would be helpful in supporting the achievement of the future state capabilities. Those include:

Voice Related:

- V4, V5, and V10 will need tactical gateways along with the Strategic Technology Reserve (STR) to enhance their impact. These gateways are possibly included in the Strategic Technology Reserve caches, but others may be needed as well.
- V6 notably does not include or rely on the STARS system for implementation. STARS is outside the scope of this capability.
- V9 would need long haul (long distance reach) for voice capabilities. This capability specifically seeks to keep EOCs and PSAPs from relying on the public telephone network.

Data Related:

- D2, D5, and D10 all needed additional wireless service to ensure the successful implementation of the capability.
- D5 would require additional subscriber equipment to fulfill the capability.
- D2 and D7 would require long haul (long distance reach) data exchange mechanism to support information sharing and access, which may be achievable through a satellite system.
- D1-D17 required governance and use protocols to enable the coordinated and consistent implementation and use of these capabilities.

5 APPENDIX

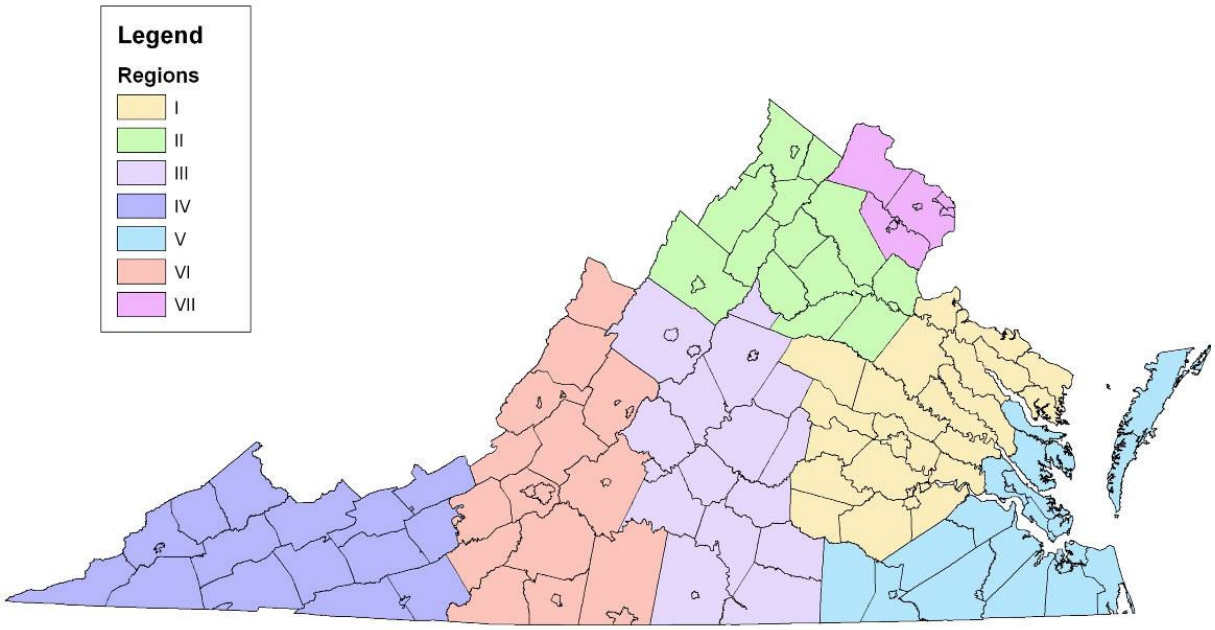
5.1 List of Ops Model IAT Members (VA Stakeholders)

Region	Name	Organization
Region 1: Richmond	Pugh, Todd	Henrico Co.
	Stewart, Jackie	Richmond Regional Planning District Commission
	Thomas, George	Chesterfield Co. Emergency Communications
Region 2: Culpeper	Myer, Philip	Fauquier Co. Emergency Services
Region 3: Central Virginia	Hamlett, Garland	Charlotte Co. Board of Supervisors
	Sidebottom, Marge	UVA
Region 4: Southwest	Harris, Pokey	VITA, Southwest VA EMS Council
	Marrah, Brenda	Carroll Co. Office of Resource Development
Region 5: Tidewater	Yeomans, Harry	Hampton Roads Planning District Commission
Region 6: Roanoke	Hairston, Dean	City of Danville Police Department
Region 7: Northern Virginia	Penn, Mark	City of Alexandria, Emergency Management
	Souder, Steve	Fairfax Co., Emergency Communications Center
State Agencies / Associations	Bolton, Michael (Capt.)	VSP/STARS
	Bowers, Don	VA Professional Firefighters
	Buisset, Vic	VDEM
	Crumpler, Ken	Virginia Department of Health/Office of Emergency Medical Services (VDH/OEMS)
	Hoppes, Paul	VITA
	Mazaroff, Steve	VITA
	McIntosh, Chris	VDEM
	Struzzieri, Thomas	VSP/STARS
	Webb, Bill	VDH

5.2 Operations Model IAT Meeting Schedule

IAT Meeting	Purpose/Discussion Focus
IAT Meeting #1	• To kickoff the Ops Model IAT • To begin discussion of Ops Model content
IAT Meeting # 2	• To validate current state assessment and analysis • To begin development of future state capabilities list
IAT Meeting # 3	• To finalize current state assessment and analysis • To refine the future state capabilities list
IAT Meeting # 4	• To refine the future state capabilities list (remaining topic areas) • To finalize future state capabilities for use in the Ops Model
IAT Meeting # 5	• To add context and description to future state capabilities
SIEC Meeting	• To review Ops Model draft • To begin analysis of current CoVA initiatives relative to the future state capabilities list
IAT Meeting # 6	• To upgrade and review Ops Model based on SIEC feedback/comments/questions

5.3 Overview Map for the Virginia Regional Preparedness Advisory Committee Regions



5.4 Operations Model Sources

Federal and State Communications Interoperability Documentation that were referenced for the creation of the Operation Model include:

- The Commonwealth of Virginia Emergency Operations Plan (COVEOP)
- DHS Target Capabilities List (TCL)
- Virginia Interoperability Baseline Assessment Report
- Commonwealth of Virginia 2008 Strategic Plan for Statewide Communications Interoperability
- Feasibility Study for Deploying Interoperability Channels

5.5 Terms and Definitions:

NIMS Incident Types

The following excerpt was taken from the *ICS-300: Intermediate ICS for Expanding Incidents – Students Manual, August 2006, pgs. 2A – 20-21*

Type 5	▪ The incident can be handled with one or two single resources with up to six personnel. ▪ Command and General Staff positions (other than the Incident Commander) are not activated. ▪ No written Incident Action Plan (IAP) is required. ▪ The incident is typically contained within an hour or two after resources arrive on scene. ▪ Examples include a vehicle fire, an injured person, or a police traffic stop.
Type 4	▪ Command Staff and General Staff functions are activated only if needed. ▪ Several resources are required to mitigate the incident, possibly including Task Forces or Strike Teams. ▪ The incident is typically contained within one operational period in the control phase, usually within a few hours after resources arrive on scene. ▪ The Agency Administrator may have briefings, and ensure the complexity analysis and delegation of authority are updated. ▪ No written IAP is required but a documented operational briefing will be completed for all incoming resources. ▪ Examples include a major structure fire, a multiple vehicle crash with multiple patients, an armed robbery, or a small hazmat spill.
Type 3	When capabilities exceed initial attack, the appropriate ICS positions should be added to match the complexity of the incident. ▪ Some or all of the Command and General Staff positions may be activated, as well as Division/Group Supervisor and/or Unit Leader level positions. ▪ A Type 3 Incident Management Team (IMT) or incident command organization manages initial action incidents with a significant number of resources, an extended attack incident until containment/control is achieved, or an expanding incident until transition to a Type 1 or Type 2 team. ▪ The incident typically extends into multiple operational periods. ▪ A written IAP is typically required for each operational period. ▪ Examples include a tornado touchdown, earthquake, flood, or multi-day hostage stand-off situation.
Type 2	This type of incident extends beyond the capabilities for local control and is expected to go into multiple operational periods. A Type 2 incident may require the response of resources out of area, including regional and/or national resources, to effectively manage

	the operations. ▪ Most of all of the Command and General Staff positions are filled. ▪ A written IAP is required for each operational period. ▪ Many of the functional units are needed and staffed. ▪ Operations personnel normally do not exceed 200 per operational period and total incident personnel do not exceed 500 (guidelines only). ▪ The Agency Administrator is responsible for the incident complexity analysis, Agency Administrator briefings, and the written delegation of authority. ▪ Typically involve incidents of regional significance.
Type 1	This type of incident is the most complex, requiring national resources to safely and effectively manage and operate. ▪ All Command and General Staff positions are activated. ▪ Operations personnel often exceed 500 per operational period and total personnel will usually exceed 1,000. ▪ Branches need to be established. ▪ The Agency Administrator will have briefings, and ensure that the complexity analysis and delegation of authority are updated. ▪ Use of resource advisors at the incident base is recommended. ▪ There is a high impact on the local jurisdiction, requiring additional staff for office administrative and support functions.

NIMS terms
For the purposes of the NIMS terms used in the Ops Model, the following terms have been listed. For a full list of the NIMS Glossary, visit http://www.nimsonline.com/nims_3_04/glossary_of_key_terms.htm.

Agency: A division of government with a specific function offering a particular kind of assistance. In ICS, agencies are defined either as jurisdictional (having statutory responsibility for incident management) or as assisting or cooperating (providing resources or other assistance).

Available Resources: Resources assigned to an incident, checked in, and available for a mission assignment, normally located in a Staging Area.

Branch: The organizational level having functional or geographical responsibility for major aspects of incident operations. A branch is organizationally situated between the section and the division or group in the Operations Section, and between the section and units in the Logistics Section. Branches are identified by the use of Roman numerals or by functional area.

Common Operating Picture: A broad view of the overall situation as reflected by situation reports, aerial photography, and other information or intelligence.

Communications Unit: An organizational unit in the Logistics Section responsible for providing communication services at an incident or an EOC. A Communications Unit may also be a facility (e.g., a trailer or mobile van) used to support an Incident Communications Center.

Dispatch: The ordered movement of a resource or resources to an assigned operational mission or an administrative move from one location to another.

Division: The partition of an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the manageable span of control of the Operations Chief. A division is located within the ICS organization between the branch and resources in the Operations Section.

Emergency: Absent a Presidentially declared emergency, any incident(s), human-caused or natural, that requires responsive action to protect life or property. Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, an emergency means any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States.

Emergency Operations Centers (EOCs): The physical location at which the coordination of information and resources to support domestic incident management activities normally takes place. An EOC may be a temporary facility or may be located in a more central or permanently established facility, perhaps at a higher level of organization within a jurisdiction. EOCs may be organized by major functional disciplines (e.g., fire, law enforcement, and medical services), by jurisdiction (e.g., Federal, State, regional, county, city, tribal), or some combination thereof.

Event: A planned, nonemergency activity. ICS can be used as the management system for a wide range of events, e.g., parades, concerts, or sporting events.

Group: Established to divide the incident management structure into functional areas of operation. Groups are composed of resources assembled to perform a special function not necessarily within a single geographic division. Groups, when activated, are located between branches and resources in the Operations Section (See Division.)

Incident: An occurrence or event, natural or human-caused, that requires an emergency response to protect life or property. Incidents can, for example, include major disasters, emergencies, terrorist attacks, terrorist threats, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, war-related disasters, public health and medical emergencies, and other occurrences requiring an emergency response.

Incident Commander (IC): The individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources. The IC has overall authority and responsibility for conducting incident

operations and is responsible for the management of all incident operations at the incident site.

Initial Action: The actions taken by those responders first to arrive at an incident site.

Initial Response: Resources initially committed to an incident.

Jurisdiction: A range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority. Jurisdictional authority at an incident can be political or geographical (e.g., Federal, State, regional, county, city, or tribal boundary lines) or functional (e.g., law enforcement, public health).

Local Government: A county, municipality, city, town, township, local public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; an Indian tribe or authorized tribal organization, or in Alaska a Native village or Alaska Regional Native Corporation; a rural community, unincorporated town or village, or other public entity. See Section 2 (10), Homeland Security Act of 2002, Pub. L. 107-296, 116 Stat. 2135 (2002).

Multi-jurisdictional Incident: An incident requiring action from multiple agencies that each have jurisdiction to manage certain aspects of an incident. In ICS, these incidents will be managed under Unified Command.

Mutual-Aid Agreement: Written agreement between agencies and/or jurisdictions that they will assist one another on request, by furnishing personnel, equipment, and/or expertise in a specified manner.

Resources: Personnel and major items of equipment, supplies, and facilities available or potentially available for assignment to incident operations and for which status is maintained. Resources are described by kind and type and may be used in operational support or supervisory capacities at an incident or at an EOC.

Resource Management: Efficient incident management requires a system for identifying available resources at all jurisdictional levels to enable timely and unimpeded access to resources needed to prepare for, respond to, or recover from an incident. Resource management under the NIMS includes mutual-aid agreements; the use of special Federal, State, local, and tribal teams; and resource mobilization protocols.

Resources Unit: Functional unit within the Planning Section responsible for recording the status of resources committed to the incident. This unit also evaluates resources currently committed to the incident, the effects additional responding resources will have on the incident, and anticipated resource needs.

Response: Activities that address the short-term, direct effects of an incident. Response includes immediate actions to save lives, protect property, and meet basic

human needs. Response also includes the execution of emergency operations plans and of mitigation activities designed to limit the loss of life, personal injury, property damage, and other unfavorable outcomes. As indicated by the situation, response activities include applying intelligence and other information to lessen the effects or consequences of an incident; increased security operations; continuing investigations into nature and source of the threat; ongoing public health and agricultural surveillance and testing processes; immunizations, isolation, or quarantine; and specific law enforcement operations aimed at preempting, interdicting, or disrupting illegal activity, and apprehending actual perpetrators and bringing them to justice.

Unit: The organizational element having functional responsibility for a specific incident planning, logistics, or finance/administration activity.

Commonly Used Terms

Almost immediate – Very soon upon request, but recognizes that at least one intermittent connection or process step is needed

Immediate – No request of a third party is needed, and a connection is instantly achieved or constantly turned on

Operability: A basic level of communications or connectivity for an agency, where the agency responders can talk, communicate, or exchange data among themselves within their own jurisdictions.

Primary First Responders – Police, Fire, EMS

Real time – No request of a third party is needed, and a connection is immediately achieved

SAR Teams – These are specialized teams that locate, rescue (extricate), and provide initial medical stabilization of victims trapped in confined spaces.

Acronyms

AASHTO: American Association of State Highway and Transportation Officials
ARES: Amateur Radio Emergency Services
APCO: Association of Public Safety Communications Officer, Incorporated
COMLINC: Commonwealth Link to Interoperable Communications
COINs: Communities of Interest
CICO: Commonwealth Interoperability Coordinator Office
CoVA: Commonwealth of Virginia
COVEOP: Commonwealth of Virginia Emergency Operations Plan
CAD: Computer Aided Dispatch
CAOs: County Administrative Officers
EMMA: Emergency Management Mapping Application
EMS: Emergency Medical Services

EOC: Emergency Operations Center
FCC: Federal Communications Commission
FCCA: Forestry Conservation Communications Association
GIS: Geographic Information Systems
GIS: Geospatial Information Systems
IAT: Initiative Action Team
INETs: Institutional Networks
IMSA: International Municipal Signal Association
MDT: Mobile Data Terminal
MHz: Megahertz
NIMS: National Incident Management Systems
NITA: National Information Technology Agency
NPSPAC: National Public Safety Planning Advisory Committee
Ops Model: Commonwealth of Virginia Operations Model
RACES: Radio Amateur Civil Emergency Services
RF: Radio Frequency
RPACs: Regional Preparedness Advisory Committee
STARS: Statewide Agency Radio System
Statewide Plan: 2008 Commonwealth of Virginia Strategic Plan for Statewide Communications Interoperability
SAR: Search and Rescue
SIRS: State Interdepartmental Radio Systems
SIEC: Statewide Interoperability Executive Committee
STR: Strategic Technology Reserve
TICP: Tactical Interoperable Communications Plan
TCL: Target Capabilities List
UHF: Ultra High Frequency
VDEM: Virginia Department of Emergency Management
VSP: Virginia State Police
VGIN: Virginia Geographic Information Network
VITA: Virginia Information Technology Agency
VoIP: Voice Over Internet Protocol
WebEOC: Emergency Management Software